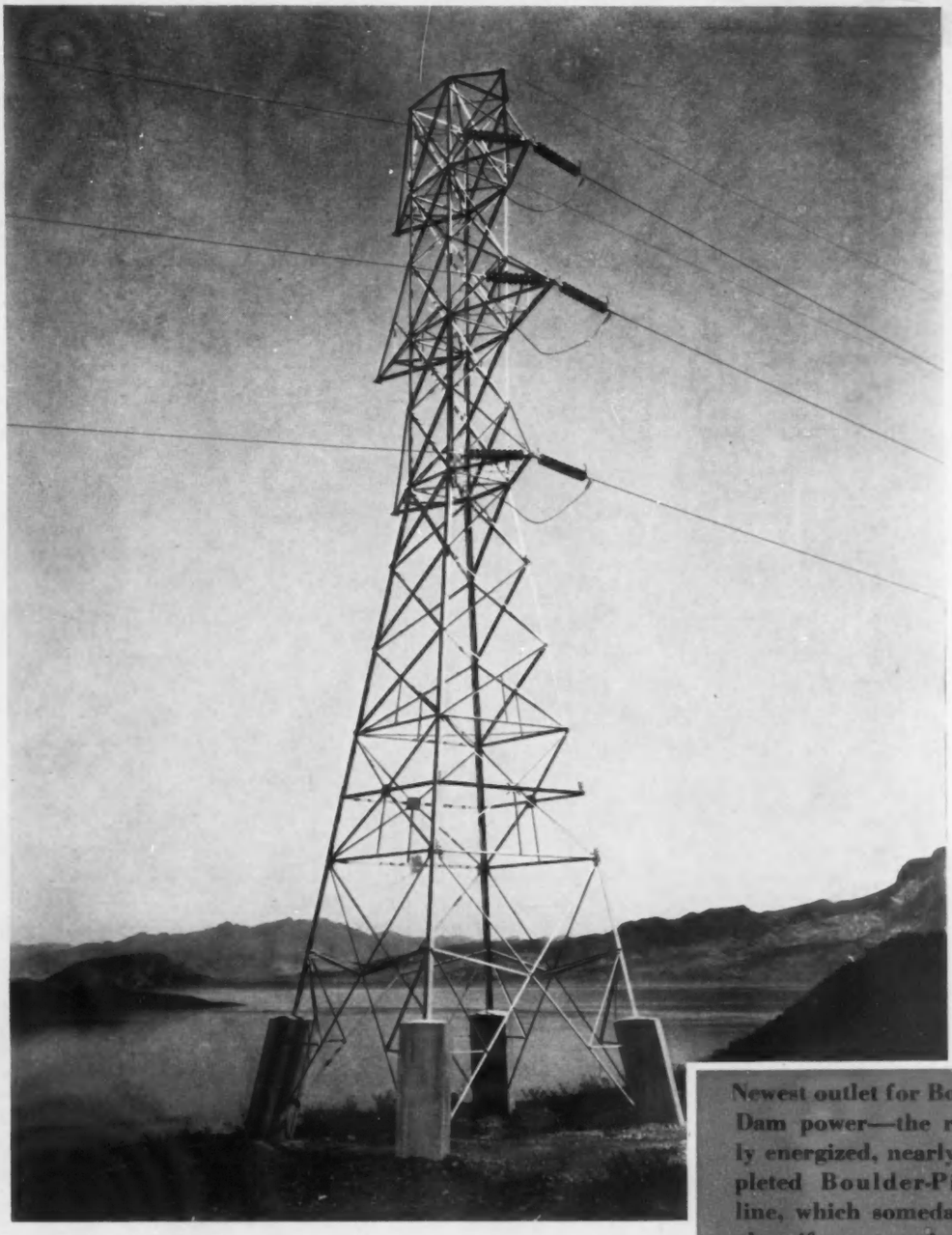
ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS



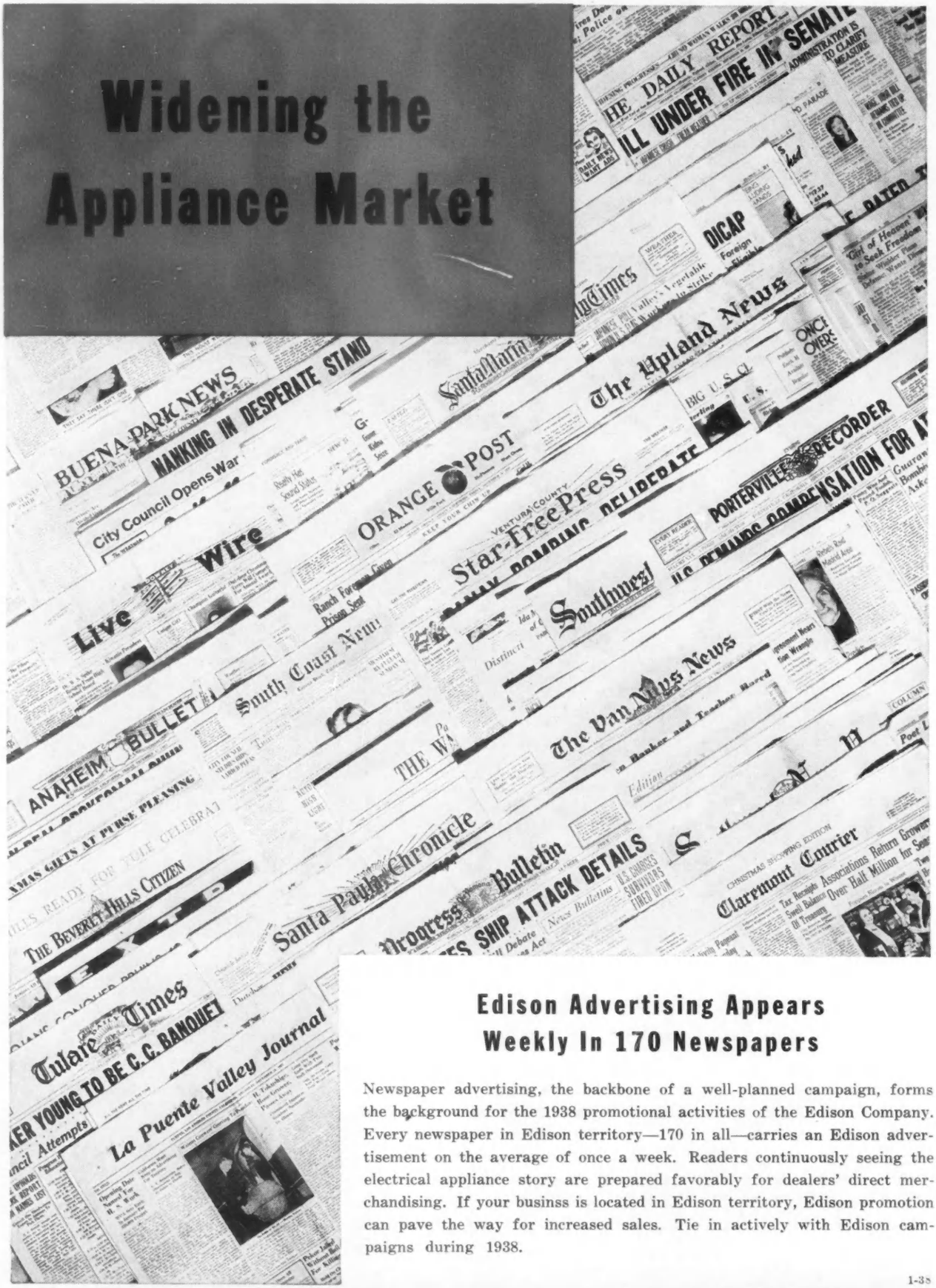
Newest outlet for Boulder Dam power—the recently energized, nearly completed Boulder-Pioche line, which someday will electrify extensive ore workings near Las Vegas. By then, Lake Mead probably will cover all but 6 inches of this tower's concrete footings.

JANUARY 1938 . . McGraw-Hill Co. of Calif.

Price 25 cen

TK1
.E495

Widening the Appliance Market



Edison Advertising Appears Weekly In 170 Newspapers

Newspaper advertising, the backbone of a well-planned campaign, forms the background for the 1938 promotional activities of the Edison Company. Every newspaper in Edison territory—170 in all—carries an Edison advertisement on the average of once a week. Readers continuously seeing the electrical appliance story are prepared favorably for dealers' direct merchandising. If your businss is located in Edison territory, Edison promotion can pave the way for increased sales. Tie in actively with Edison campaigns during 1938.

1-38

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), January, 1938, Vol. 80, No. 1. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shilling). Single copy, 25c.
Copyright, 1938, McGraw-Hill Company of California.

"The All-Industry Magazine of Progress"

ELECTRICAL WEST

MEMBER AUDIT BUREAU OF CIRCULATIONS

WITH WHICH ARE CONSOLIDATED THE "ELECTRICAL JOURNAL," THE "JOURNAL OF ELECTRICITY, POWER & GAS," AND THE "JOURNAL OF ELECTRICITY"

★

Established 1887

★

Contents for January, 1938—Vol. 80, No. 1

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In his article last month, Dr. Adam S. Bennion offered one brief cure for the electrical industry's ills—start confidence-building at home. This month Dr. Bennion completes his statement by outlining a course of employee training.

Economic aspects of applying capacitors to distribution lines in San Joaquin Valley is a "Rainmaker's Riddle." H. H. Minor competently approaches its solution on page 30. Carrying Boulder power north, installing a pre-fabricated bus structure, controlling lights with vacuum tubes, raising voltage without arousing complaints round out the Engineering Section.

What does the dealer want in a sales agreement with a manufacturer? You'll find the answer on page 35—definite recommendations from a successful sales-minded contractor.

Hang on to your copy of Electrical West next month, you may want to refer to it throughout the year. Engineering and commercial programs for 1937 and 1938 will be concisely summarized. Important data will appear in tables for quick reference. In addition, each branch of the industry will be represented by a spokesman, speaking for his branch. Associations, Maintenance, Wiring and Lighting Sections, and departments will appear as usual.

George C. Tenney, Editor . . W. A. Cyr, Associate Editor
Wayne Snowden, Engineering Editor . Stanley Schuler, Assistant Editor
Roy N. Phelan, Manager . Hans Hjorth, Typography

★

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883 Mission St., San Francisco, Cal.

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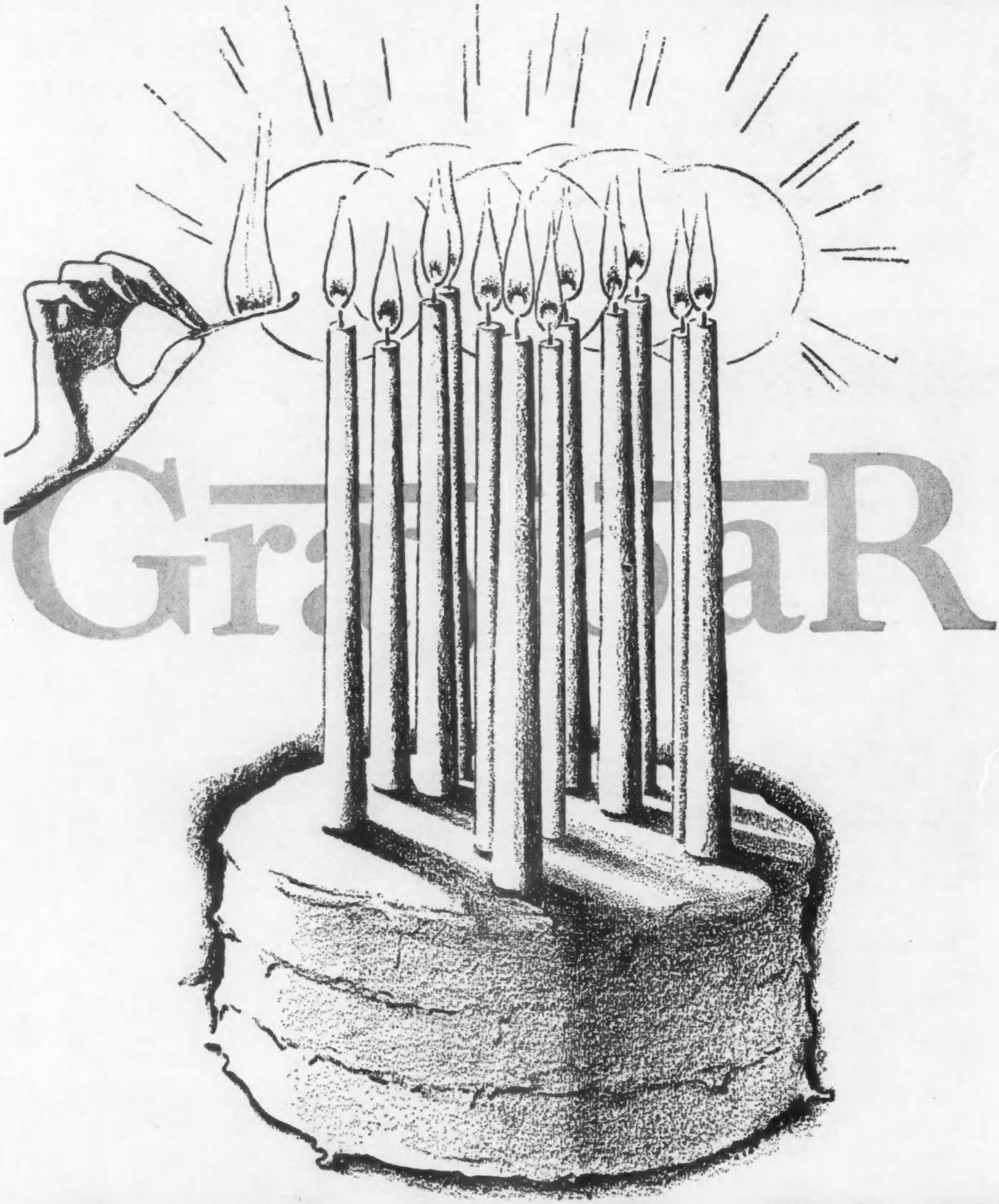

12 YEARS OLD

69 YEARS IN BUSINESS

In 1869, Gray and Barton; in 1882, Western Electric Supply Department; since January 1, 1926, GRAYBAR

VARNISHED CAMBRIC • RUBBER POWER CABLES • BUILDING WIRE • RADIO WIRES • SIGNAL CABLE • FLEXIBLE CORDS • LEAD ENCASED AND PARKWAY CABLES • ARMORED CABLE

CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

CRESCENT

INSULATED WIRE AND CABLE

To insure that the combination of ingredients, the mixing and the vulcanization of a rubber compound are equal to Crescent's high quality standard, which enable the insulation to meet the most rigid requirements, we subject the rubber compound to an exacting test for tensile strength, elongation and set, both before and after accelerated aging.

Just as other tests certify its acid, water and wear-resistant qualities, Crescent rubber here proves its ability to withstand the mechanical strain to which it is subjected during installation and operation.

The third in a Series of Sidelights on the Production of CRESCENT WIRE and CABLE

CRESCENT INSULATED WIRE & CABLE CO. INC.
TRENTON, NEW JERSEY

WESTERN REPRESENTATIVES

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Henger-Seltzer Co.
130 S. Hewitt St.

SAN FRANCISCO
Hodges & Glomb
1264 Folsom St.

KANSAS CITY, MO.
W. F. Howe
526 Law Bldg.

CRESCENT ENDURITE SUPER-AGING INSULATION • WEATHER-PROOF WIRE

"On top"
for Rugged EFFICIENT SERVICE
On
Rural Lines
THE new Pacific Electric automatic service restorer has "top" recognition from scores of utilities for reliable and economical service. It has proves to be the ideal solution for many rural line budgets. Low initial cost yet rugged dependable construction makes it an outstanding value. For complete details write us today. There is no obligation.
• NOTE THESE FEATURES •
Positive protection regardless of weather conditions is insured by completely enclosed operating arm, and automatic resetting of oil contacts. Operating parts are maintenance FREE. Mid sectional location of parts, replacing parts as a unified assembly.
Proving
This Pacific Electric
Automatic Service Restorer
FITS RURAL LINE NEEDS
Scores of utilities from Coast to Coast have installed Pacific Electric pole top Service Restorers to ensure their rural customers quality service at low cost. Investigate these money saving features.

"..advertising in your publications has been a real help to our salesmen in securing this additional business.."

TO MEET A DEMAND!
PACIFIC ELECTRIC
now offers a
LARGER
AUTOMATIC
SERVICE RESTORER
(TYPE AP-2, 15 KV.)
• HERE is Pacific Electric's answer to a popular demand for a higher voltage automatic service restorer similar in design to the fine proven type AP-1. Known as TYPE AP-2, it is rated at 15,000 volts, 100 amperes. For dependable and economical performance it pays to install Pacific Electric Automatic Service Restorers on your lines. Scores of utilities from coast to coast are assuring their customers better service by installing this protective device. So if you haven't investigated the savings, write today for details.
PACIFIC SERVICE RESTORERS PROVIDE—
Pacific Electric Mfg. Corp.
5015 3rd St., San Francisco, California • Dunes Highway, Gary, Indiana
ELECTRICAL WORLD • JULY 17, 1937
"Fits Rural Line Budgets"
PACIFIC ELECTRIC AUTOMATIC SERVICE RESTORER
IMPROVES SERVICE
REDUCES MAINTENANCE
LOWERS COST
For dependable overload protection on rural lines, scores of utilities use the Pacific Electric Automatic Service Restorer. Its design permits easy installation and provides low cost maintenance by eliminating the necessity of replacing parts in order to restore service.
Customers rarely realize that an interruption in service has occurred when Pacific Electric Restorer is on the job. It clears shorts effectively and restores service automatically with-out using any auxiliary power.
You, too, can improve your rural line service and save money by specifying this protective device—perfected to fit rural line budgets. Why not let us tell you of its features? Without obligation of course.
WRITE FOR BULLETIN NO. 47
Pacific Electric Mfg. Corp.
5015 Third St., San Francisco, Calif. • Dunes Highway, Gary, Indiana
ELECTRICAL WORLD • APRIL 24, 1937

Pacific Electric Mfg. Corporation.

5815 THIRD STREET
SAN FRANCISCO, CAL.

EDW. F. SIXTUS
VICE PRESIDENT
IN CHARGE OF SALES

October 11, 1937

Mr. R. M. Phelan
McGraw-Hill Publishing Co., Inc.
883 Mission Street
San Francisco, California

Dear Mr. Phelan:

During the past year we have increased our advertising in your publications, Electrical World and Electrical West.

I thought you would be interested to know that in addition to receiving many worthwhile inquiries from the United States we have also had them from Canada, Hawaii, England, Ireland, France, Australia, Chile, New Zealand and Belgium. One of the inquiries from Belgium lead to a sale of our product which was exported to Siam.

We do not have representatives in a number of these countries and the business we have secured therefrom has been dependent entirely upon leads secured through our advertising.

Our business during the past year has shown material growth and we feel our advertising in your publications has been a real help to our salesmen in securing this additional business.

Cordially yours,

PACIFIC ELECTRIC MFG. CORPORATION

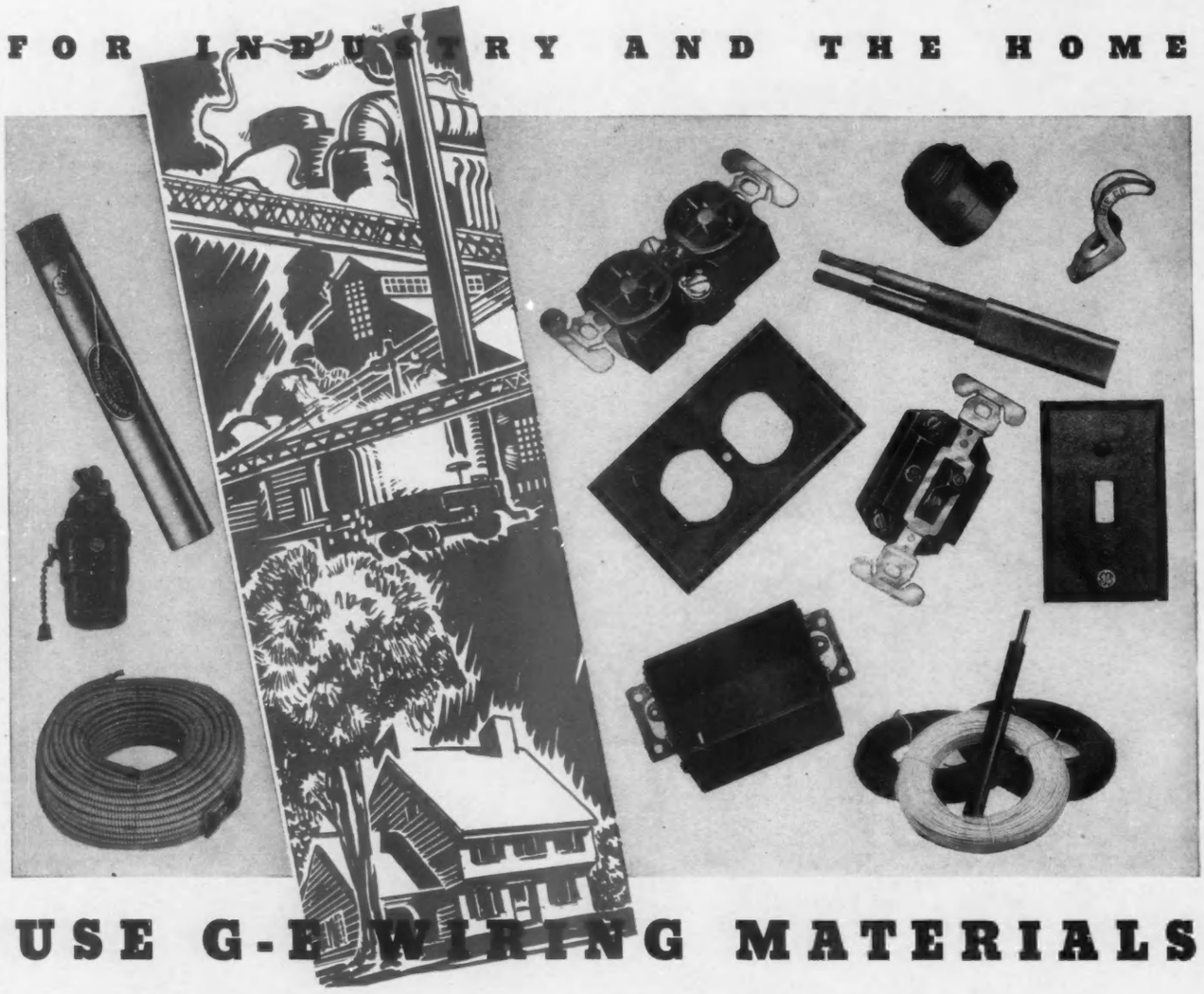
Edw. F. Sixtus

Vice President in Charge of Sales

It pays to advertise . . . in

McGRAW-HILL PUBLICATIONS

FOR INDUSTRY AND THE HOME



USE G-E WIRING MATERIALS

For adequate wiring in industry and the home, use G-E Wiring Materials. The long-established G-E line is famous for its uniform high quality, good design and enduring service. You can always get the right conduit, wire and cable and wiring devices to satisfy your electrical requirements.

Use G-E Wiring Materials for new wiring and for modernization work. They reduce maintenance costs in factories and commercial buildings, and promote full comfort and electrical convenience when used in wiring systems planned for apartment houses and homes.

The G-E line includes: White Rigid Conduit, Boxes and Fittings, Fiberduct for Underfloor Wiring, "BX" Armored Cable, Service Entrance Cable, Building Wire, Braided and Rubber-covered Cords, Branch-circuit Circuit Breakers, Fuses, Switches, Plates, Lampholders, Outlets, Plugs and Cord Sets.

Get complete information from your nearest General Electric Merchandise Distributor, or write to Section CDW-8211, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC
WIRING MATERIALS

APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

LOWEST IN TEMPERATURE RISE . . . another high spot in

TODAY'S TREND TOWARD PYREX POWER INSULATORS

PYREX is a Trade Mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

OKOLITE

Resistant to HEAT·MOISTURE·CORONA

A dramatic picture but it shows the destructive processes going on in rubber-insulated cables when the wrong insulation is subjected to corona and extremes of temperature and moisture.

OKOLITE insulation handles these conditions. It is effectively resistant to HEAT, MOISTURE and CORONA. Where it is desired to avoid having a lead sheath, OKOLITE is *the* satisfactory insulation.

OKOLITE insulation meets exacting laboratory tests and is backed with an impressive performance record. Millions of feet of OKOLITE insulated cable are operating in diversified use throughout the country.

OKOLITE insulation can effect large savings in plant construction and maintenance. A study of OKOLITE characteristics and performance will show the wide usefulness of this insulation. Its scope ranges from a small control cable to heavy generator leads —or a submarine power cable.

THE OKONITE COMPANY

Founded 1878

HAZARD INSULATED WIRE WORKS DIVISION

THE OKONITE-CALLENDER CABLE COMPANY, INC.

EXECUTIVE OFFICE: PASSAIC, N. J.

New York Boston Seattle Buffalo Chicago Dallas Detroit Atlanta
Philadelphia Los Angeles Pittsburgh St. Louis Washington San Francisco

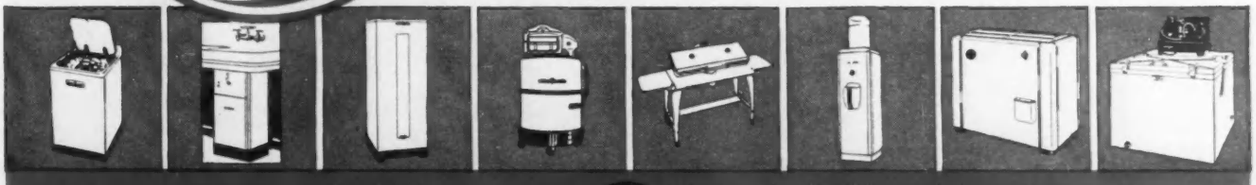
Factories: Passaic, N. J. Wilkes-Barre, Pa. Paterson, N. J.

YOU'LL get to Profitown faster and more surely if you take the MAINLINE. No detours. No stopovers. And no extra fare! Get aboard and go places with General Electric in 1938—*it's another G-E year!*

In General Electric Appliances you have a *complete* line—headed by the popular Triple-Thrift Refrigerator that is the sales sensation of the year. *Every* General Electric product has been proved by performance—and is identified by the famous G-E monogram familiar to practically every wired home in America. It's a great name and a great line of products.

This year G-E sales features are even more attractive, prices even more flexible, and promotion even more helpful than ever. G-E is years ahead—while others experiment General Electric perfects. See the new 1938 line of G-E Refrigerators, G-E Ranges, G-E Electric Sink (with Dishwasher and Disposall), G-E Washers, G-E Ironers, and the G-E "packaged" commercial refrigeration products. General Electric Company, Appliance Div., Nela Park, Cleveland, O.

The COMPLETE *line of electrical appliances—every one proved by performance*



GENERAL ELECTRIC

A TRAINLOAD OF SELLING IDEAS!

A TRAINLOAD OF SELLING IDEAS!

Now headed for 36 factory-conducted sales conventions from coast to coast—12 railroad cars carrying the 3 Frigidaire Convention Crews and complete equipment needed to present Frigidaire's 1938 Sales Program to the Frigidaire Selling Organization! Truly an entire trainload of selling ideas!

Frigidaire Speeds on with its Most Sensational Refrigerator and Range Sales Program—Built on Facts

● Frigidaire is on track with throttle wide open. Speeding to more and greater sales goals in 1938! Out in front of all with the new sales-compelling plans to be released immediately in thirty-six factory-conducted sales conventions throughout America, and a line of new products that have already won the acclaim of dealers and customers everywhere.

Ready now for the Frigidaire selling organization is Frigidaire's smashing sales program *built on facts*—a program tuned to the times, selling themes daringly conceived and brilliantly executed because Frigidaire's products can back them up! The soundest, most direct, easiest profit-making sales plan Frigidaire ever developed!

Advertising that headlines these powerful resistance-breaking themes—biggest use of national advertising space ever—more factory-paid advertising in retail media—a most all-inclusive coverage plan to reach prospects—all balanced to sales potential—sure fire dealer help—attention-grabbing displays—dramatic demonstrating material—the most complete training program ever devised!

FRIGIDAIRE DIVISION
General Motors Sales Corporation, Dayton, Ohio.

FRIGIDAIRE
MADE ONLY BY GENERAL MOTORS

You'll do better than ever with Frigidaire in 1938!

THE GREAT AMERICAN TESTING LABORATORY

Selects

CHROMALOX

SUPER-SPEED ELECTRIC RANGE UNITS

MORE THAN ONE HUNDRED THOUSAND AMERICAN HOUSEWIVES CAN'T BE WRONG!

Why is this great army of intelligent American women cooking on Chromalox units? Every kitchen a testing laboratory, every meal a critical test, under every-day service conditions that vary from one extreme to the other. Why this unanimity of opinion among these one hundred thousand-plus users . . . and why is this number constantly growing?

Because Chromalox units show SPEED *where it counts*—in actual cooking . . . show unanswerable ECONOMY in the kitchen due to the largest flat contact area *for cooking* and their *exclusive* "two-units-in-one" construction . . . show LONG LIFE in actual home use without drop in efficiency . . . show unexampled CLEANLINESS in the easily cleaned flat top. Because three times in every day these units are *passing the test of cooking in the kitchens of America*—and that is the test for which we build them.

Write us or our nearest representative

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash. • 1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif. • 912 E. Third St., Los Angeles, Calif.
THE PETERSON COMPANY • 1921 Blake St., Denver, Colo.

EDWIN L. WIEGAND CO. . . 7540 Thomas Blvd., Pittsburgh, Pa.

The **CHROMALOX** *Super-Speed* **UNIT**

Selected on the basis of sales-building popularity, lower cooking cost, higher cooking speed, greater convenience and longer service life, for use in the following electric ranges:

A-B • Copeland • Crawford
Crown • Electromaster
Estate • Frigidaire
Kelvinator • Marion
Monarch • Norge
Prosperity • Quality
• Uni...

A Sign that

—right there on your store front, a big, handsome sign with brilliant Neon-lighted letters—dominating your street day and night with this proud message, "HERE is a busy Westinghouse Electrical Appliance Store."

To the thousands of enthusiastic present users of Westinghouse appliances it says,

"HERE you can buy that Westinghouse Electric Refrigerator, Range, or other Westinghouse Appliances you're planning to get—all of the same quality you already know so well."

To other thousands who hear these users praising their Westinghouse appliances it says,

"Here YOU can inspect them . . . see them demonstrated — buy them."

To thousands of readers of Westinghouse advertising it says,

"Here YOU will find the very appliances you have been reading about."

And to all it says,

"Here YOU will find the prompt, courteous attention, the friendly service, the convenient buying terms you'd naturally expect where the product members of this great Westinghouse family are on display."

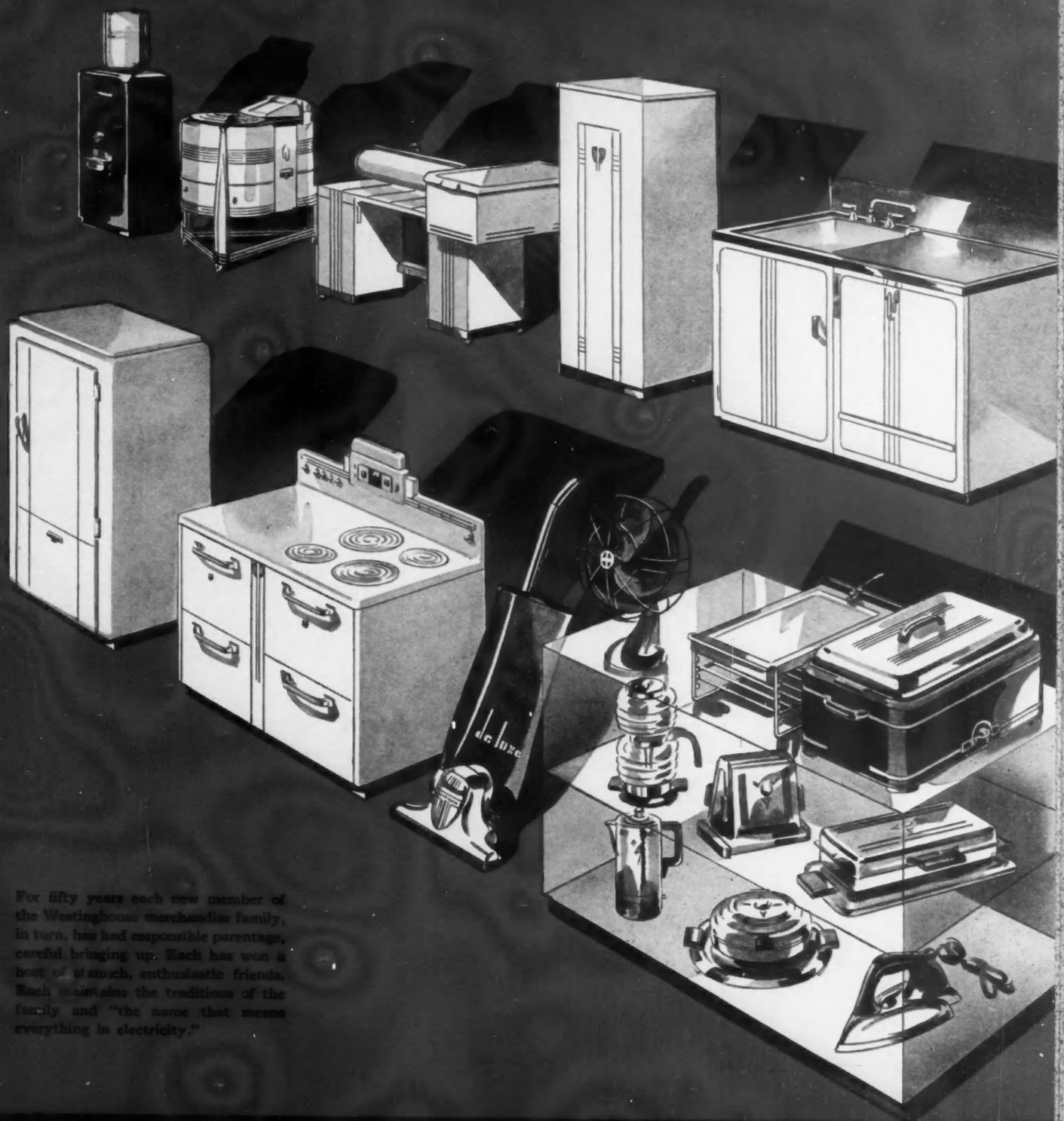
Yes, a sign of expanding future based on a proud past record—a sign that always means *busy business*—sales, profits, progress.

Ask your Westinghouse man for details of the big 1938 program, or write to Dept. 3H.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
MERCHANDISING DIVISION · MANSFIELD OHIO

VERY HOUSE NEEDS **Westinghouse**

you're going to be very busy



For fifty years each new member of the Westinghouse merchandise family, in turn, has had responsible parentage, careful bringing up. Each has won a host of staunch, enthusiastic friends. Each maintains the traditions of the family and "the name that means everything in electricity."

"The Line of Least Resistance

COMING!

The KITCHEN-PROVED range that

COOKS FAST

COOKS BETTER

SAVES MONEY

WATCH for the big announcement in this magazine next month and in country-wide meetings all during February.

LEARN the facts that give you the strongest selling story in electric range history — the amazing story taken from the experience-records of Proving Kitchen Hostesses from coast to coast.

SEE the new profit-feature 9 model line of beautiful Westinghouse Kitchen-Proved Ranges — and the powerful sales-winning promotional assistance that is all ready to work for you.

SIGN NOTHING—promise nothing—until you have seen the 1938 Westinghouse Kitchen-Proved Ranges that SELL FAST . . . SELL BETTER . . . BOOST PROFITS.

Kitchen-proved

IN 103 TYPICAL U. S. HOMES

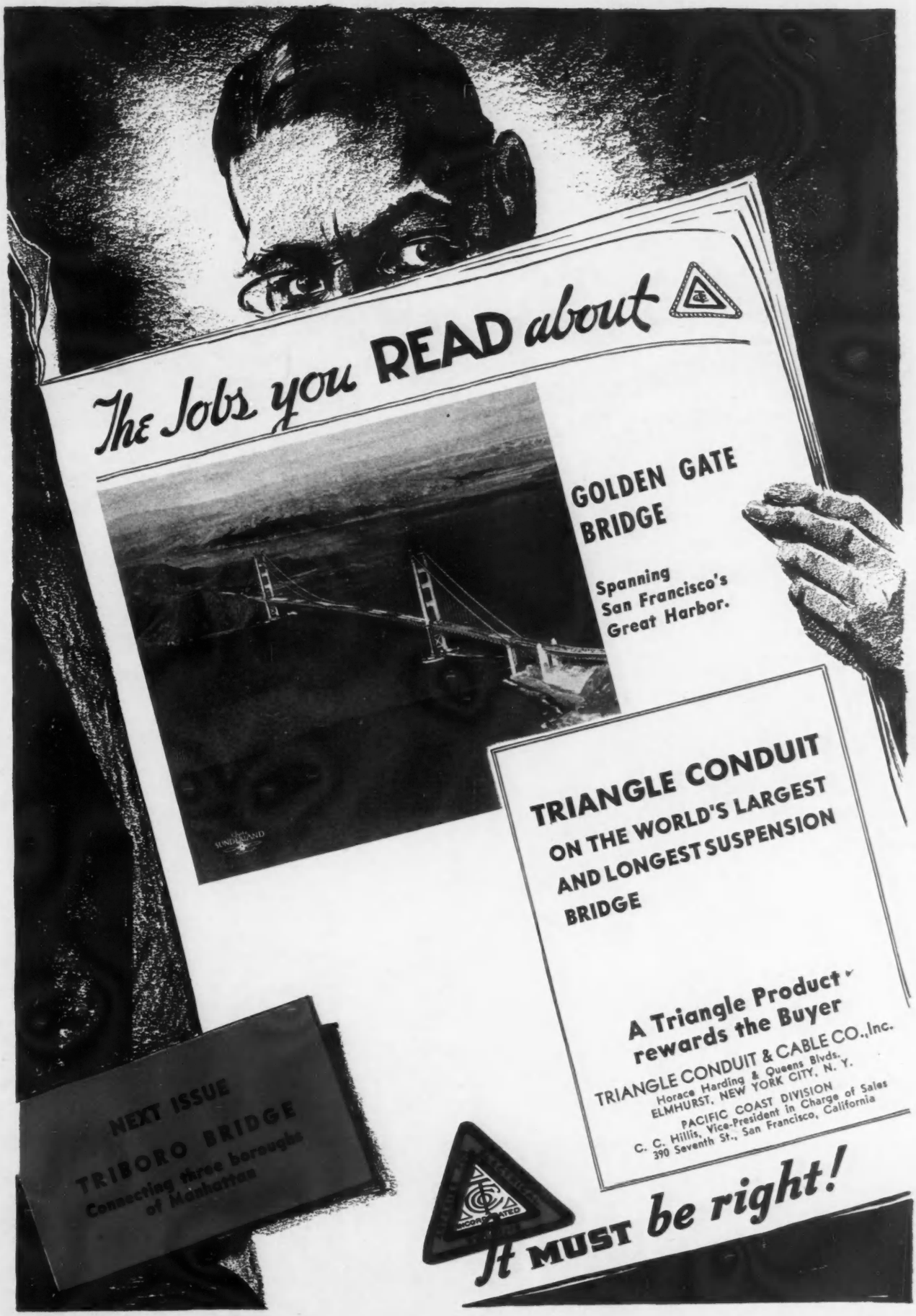
The home is where you use it . . . The home is where we proved it! In everyday home-use for three solid months, 103 Hostesses proved, as no laboratory tests ever could, that Westinghouse Electric Ranges COOK FAST . . . COOK BETTER . . . SAVE MONEY. *The certified proof is in!* See it next month. Profit from it all through 1938.

Swing Ahead WITH WESTINGHOUSE

. . . The News will be out in February!

Westinghouse Kitchen-proved Ranges

EVERY HOUSE NEEDS WESTINGHOUSE


The Jobs you READ about
GOLDEN GATE BRIDGE
Spanning San Francisco's Great Harbor.
TRIANGLE CONDUIT
ON THE WORLD'S LARGEST AND LONGEST SUSPENSION BRIDGE
A Triangle Product rewards the Buyer
TRIANGLE CONDUIT & CABLE CO., Inc.
Horace Harding & Queens Blvds.
ELMHURST, NEW YORK CITY, N. Y.
PACIFIC COAST DIVISION
C. C. Hillis, Vice-President in Charge of Sales
390 Seventh St., San Francisco, California
NEXT ISSUE
TRIBORO BRIDGE
Connecting three boroughs of Manhattan
It MUST be right!

NOW HOTPOINT OFFERS

SELECT-A-SPEED

The Outstanding Range Selling Feature

5 COOKING SPEEDS...

300 Watts to 80 Watts from One Calrod Unit

HOTPOINT opens up a vast new market with this amazing new cooking unit—the foremost line of electric ranges for 1938—and range features sought by every buyer. Get all the facts quickly. Mail the coupon.

Backing up Hotpoint's great 1938 line of ranges—and the dealers who sell them—is an all-inclusive national advertising and promotional program that will bring people in to buy. National advertising, newspaper advertising, direct mail, retail sales contest material. Be the one to profit!

HOTPOINT offers another sensational development in electric cooking units—the new Super-Speed "Select-A-Speed" Calrod. This great new Calrod unit speeds up to high heat in faster time than ever, with 1300 watts. *It maintains full rated wattage for life,* and gives a cooking speed that compares with that of any other fuel.

Select-A-Speed Calrod allows an instant choice of 5 different cooking speeds: Warm: 80 watts; Thrift: 160 watts; Quarter: 325 watts; Half: 650 watts; Super-Speed: 1300 watts.

At the "Warm" setting a slow flow of current keeps foods at serving temperatures without drying out their luscious goodness. Three speeds in between provide temperatures for all intermediate cooking operations. The Super-Speed at 1300 watts ends forever any doubt about the *speed* of electric cookery. And the "Warm" and "Thrift" heats give even greater economy.

Get all the facts. Mail the coupon right now.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5612 West Taylor Street, Chicago, Illinois

Hotpoint

SUPER SPEED with CALROD of 1938 > > > >

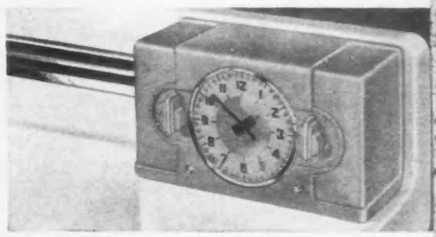
Super-Speed—Greater Economy

FIVE SPEEDS... make Select-A-Speed the most flexible electric cooking unit in the world
1. SUPER-SPEED (1300 Watts)
2. HALF (650 Watts)
3. QUARTER (325 Watts)
4. THRIFT (160 Watts)
5. WARM (80 Watts)

THE SALISBURY—Hotpoint's latest popular priced built-to-the-floor model. Full porcelain enamel; one Select-A-Speed Calrod; two Standard Hi-Speed Calrod units and Thrift Cooker. The Salisbury is completely equipped with new de luxe lamp and white condiment set. New moderne Timer Clock has built-in electrically driven Time-Chime. Warmer drawer equipped with fast-heating Calrod unit (750 watts) with built-in Safety Thermostat. Make the Salisbury your volume leader.

10 Beautiful Hotpoint Models—one Select-A-Speed Calrod Unit standard on all except apartment house models.

Easily Removable Spillage Trays—an exclusive feature of Select-A-Speed and Standard Calrod.



"Chef's Brain" Timer Clock and electrically driven built-in Time-Chime—a sales feature when talking electric cookery.

Thrift Cooker is Hotpoint's oversize 6-qt. kettle—cooks a small quantity of food or an entire meal—yet costs no more to operate than the kitchen light.

ELECTRIC RANGES

WASHERS AND IRONERS

Edison General Electric Appliance Co., In
5612 West Taylor Street, Chicago, Illinc

Please send complete facts about the new 19
Hotpoint Electric Ranges and Select-A-Speed Calro

*Name*_____

*Address*_____

*City*_____ *State*_____

GANGWAY! FOR THE

—it's that sensational

QUICK DIGEST OF NEWS ABOUT THE PRODUCT

NEW, sealed, silent POLAR POWER Unit that brings Kelvinator operating costs down to a new record low.

NEW, increased cold-making capacity, providing reserve refrigeration, if needed, equal to 1,050 pounds—*more than half a ton*—of ice a week.

NEW, freezing speed and economy—makes 72 big ice cubes for 1¢ (figured at national average rate for electric current).

NEW, exclusive Speedy-Cube Ice Release—a step ahead of anything else made today.

NEW, exclusive shelf arrangement that easily makes room for the hugest melons or turkeys —actually permits storage of more food, size for size, in Kelvinator than in other refrigerators.

NEW, stainless steel evaporator that spreads cold faster.

NEW models—15 beauties, with powerful eye appeal for women buyers.

1938 Kelvinator

CHAMPION ICE-MAKER 1938 KELVINATOR!

READ—AND WE BELIEVE YOU'LL AGREE: THIS IS A DEVELOPMENT THAT RATES WITH THE GREATEST SINCE ELECTRICAL REFRIGERATION WAS BORN

SET YOURSELF for the big news about Kelvinator for 1938!

It's the biggest thing we've ever put before the industry. The greatest product . . . the most powerful advertising program . . .

An absolutely brand-new, revolutionary idea in LOCAL, ON-THE-SPOT advertising for *each* dealer . . . plus SALES SUPPORT and active SELLING HELP never before equalled!

Literally, the greatest co-operation between manufacturer and dealer since the electric refrigerator business was born!

Look at the Product!

When we call the new 1938 Kelvinator the Champion Ice-Maker, we mean every word of it!

Its new, sealed, super-silent Polar Power Unit is so efficient and economical, it delivers *72 big ice cubes for 1¢* (figured at the national average rate for electric current).

But that's only one among many new features Kelvinator has to offer in 1938. There's more—lots more—in the list over on the opposite page. Read it. And still more not even mentioned there that you'll have to see to appreciate.

Look at the Advertising!

In short, we've got a refrigerator here so grand that no advertising technique ever used before was good enough to show it.

So we had to invent a new one—a brand new way of glorifying a refrigerator in pictures . . . telling a whole sales story in pictures . . . that will be one of the biggest wallops of the year!

And how we're going to use it! Full pages . . . full color . . . a full schedule running *continuously* in the most influential magazines in the country. Full pages in color in the Sunday sections of city newspapers—plus a big campaign in dailies—all listing dealer names!

Smashing, fighting, power-house stuff—built to make sales.

Look at the Sales Support!

Every bit of this pointed right straight to YOUR door—where you'll be prepared to meet it with the greatest sales-closing force ever put into the hands of any refrigerator dealer.

Because we've got a plan for you that will do the business!

It includes INDIVIDUALLY TAILORED local advertising . . . over your OWN name . . . in the newspapers which YOU PICK YOURSELF.

Even more important . . . It includes a SALES-CLOSING program that's the hottest thing going, today. You never saw so many tested and approved sales-training materials . . . door openers . . . carefully planned seasonal selling campaigns! Or more generous customer financing plans.

And there's plenty more! Absolutely everything you need to go to town in 1938—in a big way!

Act Now!

See the new Kelvinators and get the full 1938 story from your nearest Kelvinator distributor. Or write, Dept. EW-1.

KELVINATOR DIVISION OF
NASH-KELVINATOR CORPORATION
Plymouth Road . . Detroit, Michigan

$8,000.00 CONTEST OPEN TO INDUSTRY UNTIL JANUARY 30TH!

ANYBODY CAN GET IN . . . open to everybody in the industry! Except factory or office employees of Nash-Kelvinator. President or office boy . . . distributor or dealer . . . retail or wholesale salesmen . . . friend or foe!

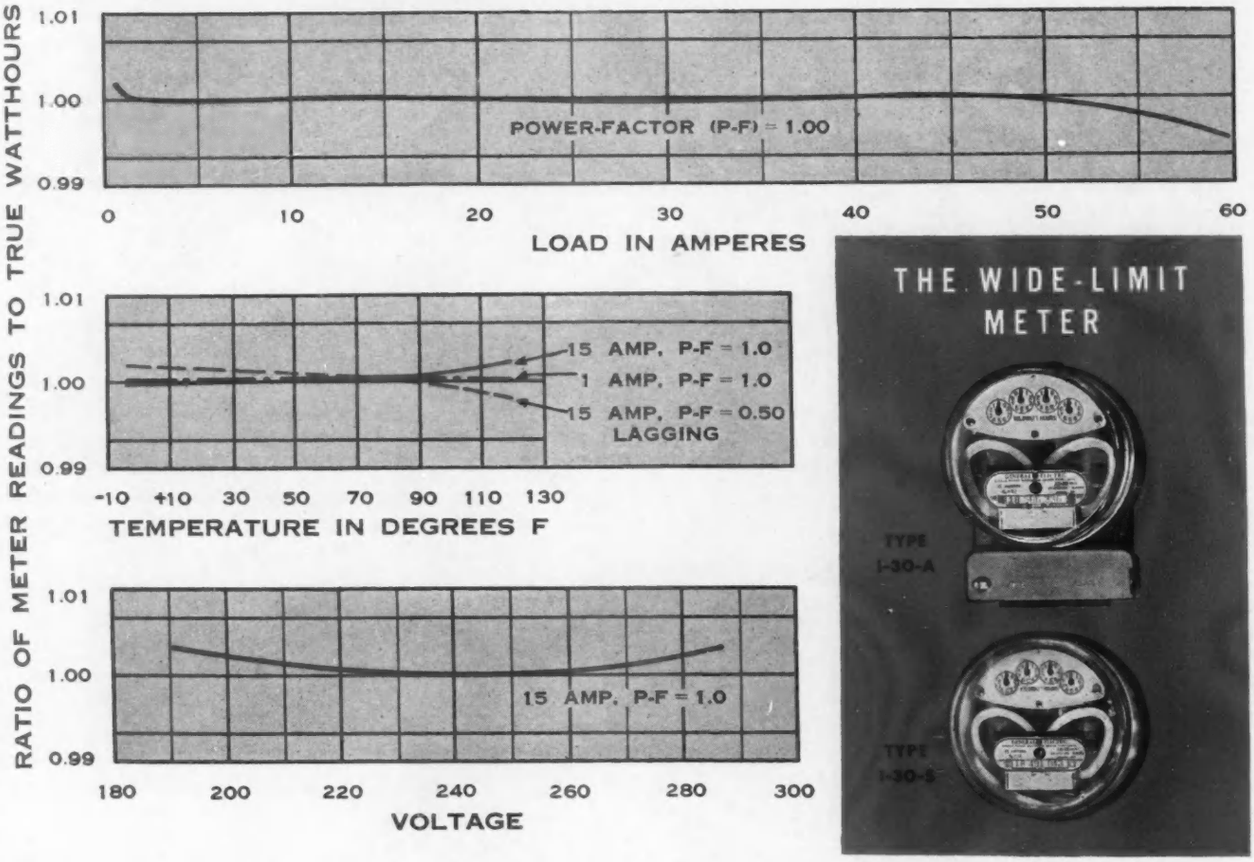
FIRST PRIZE, $5,000! Seven other prizes! Worth trying for! Easy—Just write fifty frank words.

See your nearest Kelvinator distributor. He'll give you all details; show you the line, the features . . . tell you the whole sales and advertising story.

Come one, come all! Get into this now!

The Champion Ice-Maker

NOW The WATTHOUR METER for LARGE and SMALL Single-phase Loads



WE know, today, of a six-room house so fully equipped electrically that it has a maximum demand, for appreciable periods, many hundred times as great as under light-load conditions.

That may be unusual; but it does indicate the kind of loads that you can expect in the future.

The watthour meter to measure these loads, in such a way as fully to protect your revenue, must be accurate between wide limits.

The G-E Type I-30 is such a meter. As you can see from the top curve, of the 15-ampere, 240-volt, 3-wire, 60-cycle rating, this meter has an almost straight-line characteristic between the amazingly far-apart limits of 0.5 and 60 amperes. That makes it suitable for widely varying single-phase loads.

But that is not all. See, from the other curves, how little the I-30 meter is affected by changes in temperature or voltage.

Therein lie advantages that you gain by the adoption of the Type I-30 watthour meter—simplification, low inventory investment, and protection of revenue. It will fit, without change, into any present program of meter mountings and housings.

A G-E meter specialist will gladly supply complete information and prices. Address the nearest G-E sales office, or General Electric, Dept. 6—201, Schenectady, N. Y.

GENERAL ELECTRIC

400-27

ELECTRA'S HUSBAND

Dog Tags and Social Security

ELECTRA has put her foot down on what to me seemed like a fine idea. She utterly refuses to be known as Mrs. 556-03-4864. It all happened this way: It seems that an irate publisher, intent upon impressing his employees with the increasing burden of taxes and bureaucratic regulations being placed upon his business, decreed that from now on workers must substitute their Social Security numbers for the names on office doors and on those swank little triangular nameplates which adorn desk tops.

Being one of those individualists who thoroughly resents the implication that he is too dumb to provide for his own future, I have always inwardly objected to that little form headed "Deductions" which made its appearance upon the semi-monthly pay checks since the enactment of a lot of "social" legislation. And this resentment has increased since the junking of a highly satisfactory pension plan jointly contributed to by my employer and myself and administered with justice, discretion and perspicacity —elements which appear to be lacking in the program imposed by a supposedly beneficent government. Coupled with this has been a lot of speculation as to the future, especially since a traveling journalist reported on conditions in one of the European countries very much in the headlines, where a government pension program has operated for many years. In that country one who has reached the pension-drawing age must think, act, vote and speak pretty much as dictated under threat of having his pension cut off entirely.

So the idea crystalized of substituting a number for a name. Why not? A lot of us had numbers during the brief unpleasantness which started back in 1917. My aluminum "dog tag" was thrown away with the uniform when the moths finally ate through a vital section of the pants.

Despite Electra's objections, I still think that 556-03-4864 would look well on the office door. At least it would register my protest. But Electra insists that it wouldn't do at all; there are far too many numbered individuals now in the care of the government. She must have been thinking about Alcatraz Island.

ELECTRIC cooking has the approval of at least one court of law. The story was told to Electra and me at dinner not long ago. A certain utility decided to attempt to stop some of the unethical competition which was causing a flood of reverted electric ranges to accumulate in its shops. So it brought suit to recover the payments due in one particularly flagrant case, despite the fact that it lost title to the range under the terms of the lease contract as soon as legal action was started.

The defendant was served with the papers. He hired an attorney and appeared in court on the appointed day. The utility lawyer had little or no hope of winning the case. Then the defendant took the stand. Under examination he testified as to why he failed to fulfill the terms of the contract.

"Well, your honor, we couldn't afford to cook with it. We could cook much more cheaply with gas," was his alibi.

"You could what?" queried the judge.

"We could save a lot of money by using gas," he answered.

"And you are mistaken," said the judge. "We have had three electric ranges in my home and they cook better and cheaper than anything else we could substitute. I hereby render judgment and costs in favor of the plaintiff."

Electra offers the suggestion that it might not be such a bad idea to sell electric ranges to more judges, starting with the nine venerable gentlemen in Washington.

A COUPLE of Electra's friends are building new houses and she has been talking nothing else for weeks. Her latest comments are far from complimentary to the electrical industry. And she has a real basis for her derogatory remarks.

One of these homes is just a little (?) colonial place in one of those exclusive suburban subdivisions where the minimum lot size is an acre and where advantage is taken of every live oak tree in landscaping. The contract price of the house is $16,000 and the inevitable extras have probably added another $1,000 at least. The other day Electra went down town with Mrs. Homebuilder to pick out the lighting fixtures. The allowance for this important item in the contract was $125, which was to include the cost of installation. It doesn't take much imagination to visualize the $125 lighting job in this so-called modern $21,000 home. Electra's description is too vivid for printing.

The second home is a $12,000 English affair on a metropolitan hillside. The foundations are poured, the siding is up and to date not a solitary member of the electrical industry has called upon Mr. and Mrs. Homebuilder to sell them anything electrical. (Electra is rather proud of the fact that *she* sold both of them on the idea of installing an electric range).

With a great national homebuilding movement in the offing it would appear that an organized plan ought to be developed for making these new homes truly modern electrically. This cannot be left to architects and contractors. After all, the homebuilder gets from them just what he asks and pays for—and Electra will testify that the public is not asking for things electrical.

THAT'S $11-a-day labor for you," the electrical contractor groaned to Electra. His wireman, on top of a ladder, was patiently waiting for his plumb bob to come to rest of its own slow volition rather than stop its pendulum sway and save a few minutes. "And they call *me* a robber for the high cost of wiring," he ended sarcastically, "That is what is known as 'the right to *work*', in case anyone should ask."

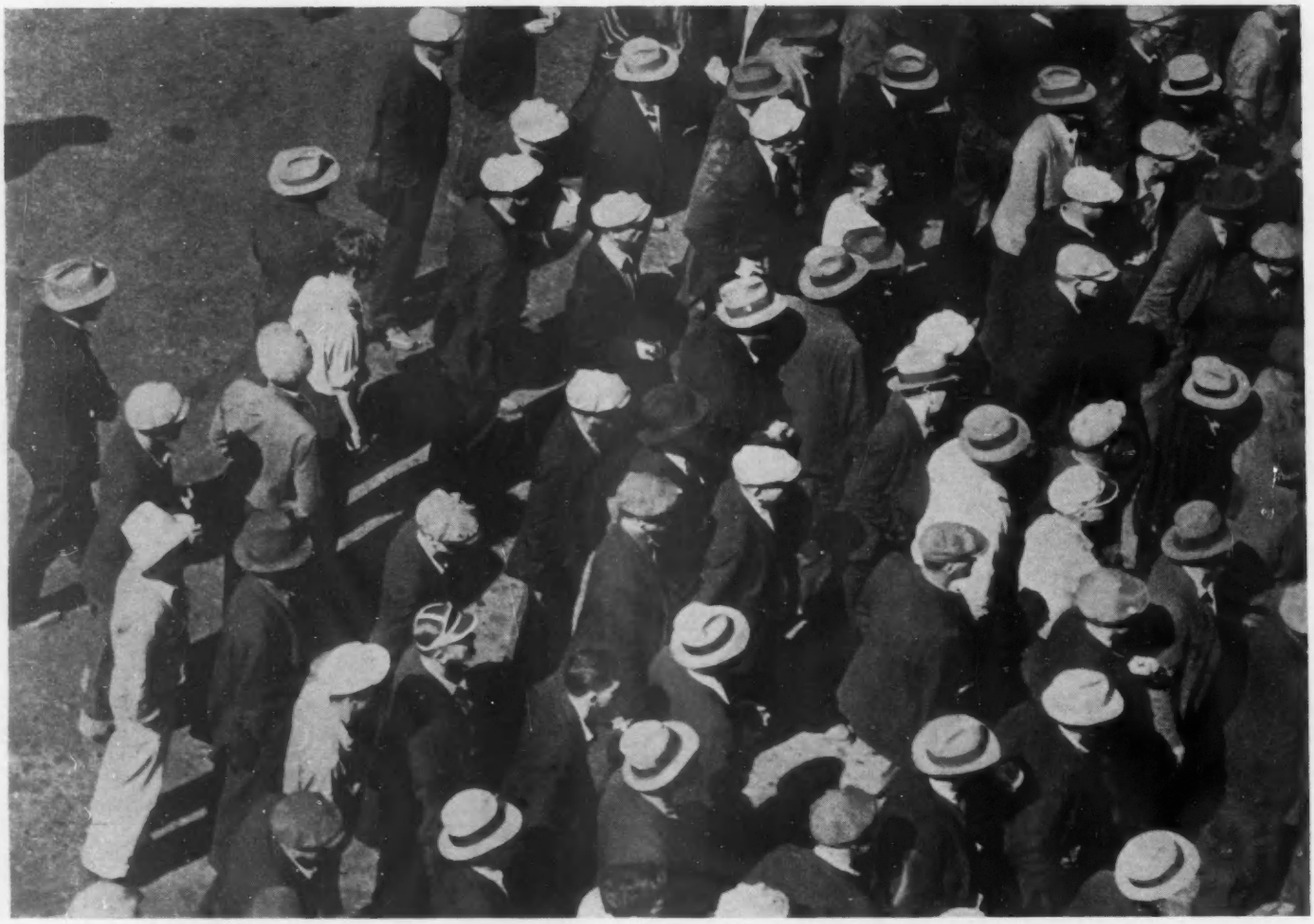


Photo by NEA Service, Inc.

Know Your Stuff — and Do It

By DR. ADAM S. BENNION
Assistant to the President,
Utah Power & Light Co.

ONE of the most successful salesmen I know—he continues to be a topper in season and out, through the years—when asked how he succeeded, offered a significant recipe to men who sell. It applies equally well to all of us who make personal contacts:

I. You got to know your stuff.
II. You got to understand people.
III. You got to be dynamic.

You Got to Know Your Stuff

Because of the crisis we are in and because of the nature of our business, making of us as it does, trustees of a public service, our employees should be particularly well trained. We should be trained to do one of the best performances in America.

If we are to "know our stuff" we shall have to do a real, educational job. To do that, it is our experience the most effective organization is a group organization. A set-up which gathers about twenty employees under the leadership of a superior employee—one who knows more or is learning more about the business than any other member of his group. This leader is the key to the whole situation and should be picked because he possesses genuine qualities of leadership.

Any adequate course of employee information involves at least three things: (a) information; (b) quality of performance, and (c) attitude.

Information: Unless emergencies demand otherwise, there is ample material here for a three year course, the first to center in historical backgrounds and organization data. Every company has its record of pioneering—a record which ordinarily most employees know little about but knowing which, they could move intelligently and proudly go forward. How did the company come to be? How has it been expanded? How financed? What are its earnings, its expenses, its outside connections, its personnel and its rates?

Here certainly is ample material for a season of significant discussions.

The second year may well be devoted to a consideration of fundamental principles in utility operation. Fortunately the field has been admirably covered. Ray Page, vice-president and general manager of the Nebraska Power Co., has written and has printed his "Primer of Electric Service Costs." It is a stimu-

lating volume. An employee equipped with an intelligent understanding of it can be immeasurably more valuable to his company.

For the third year, our company has drawn together under a *Case Method* procedure actual day to day experiences of our employees. In many ways this has proved to be our best work to date. A proof reading of our actual performance in the light of agreed-upon principles of good practice is a good tonic for our organization.

Quality of Performance — All the information in the world about a job can never be substituted for good performance. "A good job well done" is our best advertisement.

Sandwiched in with the information about our business there should be direction in the best performance of our jobs.

Foremanship training for key men is invaluable when followed by job analyses along the line. It is a revelation to see what can be done in the matter of sales floor efficiency and telephone courtesy.

Attitude—All of these things go largely for naught if there comes between them and the public a snobbish personality. An attitude of real trusteeship—a combination of efficiency, *courtesy* and *humility* should underlie this whole business of employee information.

You Got to Understand People

Ours is uniquely a field of service. Electricity amounts to nothing until it is used. And it is used by people. Even if we weren't under attack we should come to understand our customers more fully. It is really surprising how many of our ills go back to some little clash of personalities—some little misunderstanding—some trifling arbitrariness.

For a long time psychology was as much aloof to business as business was to people. Now, fortunately, men are bridging the gap. Psychology really centers in understanding people. What a Fourth course can be built around the query "Why Are People . . . . . ?"

Fortunately again, excellent material is here available. Good standard texts in psychology are helpful to group leaders but for the rank and file employees popularized treatises are better. Dale Carnegie's "How to Win Friends" can fairly revolutionize an employee's procedure. So can Wright's "Getting Along with People." Another volume, helpful especially for executives, is Rosenstein's "Psychology of Human Relations for Executives."

Public contact employees can proof read these books beautifully by their daily experience.

You Got to Be Dynamic

Translated into human terms that means "You Have to Put Your Heart Into Your Work." Utility employees have done just that. As a group they are as fine as any group I have ever known. Linemen have given their lives that the service should not fail. Others have suffered untold hardship and exposure that have never been chronicled. Accountants have worked long and hard to do the work without which companies collapse and go out of the picture. Salesmen and servicemen have carried on enthusiastically—often out of hours to build and to keep load on the line.

Two menacing developments threaten for the future.

On the one hand social security enthusiasts have all too often put a premium on leisure and relief as desirable objectives in living. They have their place. But they should not be allowed to weaken the fibre of manhood. As Carlyle said, "labor still is noble." It still is an honor to die "with boots on." Worthy institutions are built only by honest toil. Devoted duty is still one of man's finest achievements. "Watching the clock" never inspired any worthy achievement.

Last month this author reviewed the status of the electrical industry and asked the pertinent question, "So What?" His answer was that the people in the industry are its greatest asset, provided they are trained to do a job. In this article, Dr. Bennion sets up measurable standards and outlines a course of training.

On the other hand, labor agitations are genuinely disturbing. Strikes and other unfriendly relationships have ruined many a business and brought chaos into many a home. The laborer is worthy of his hire and fortunately the percentage of revenue from American business going to labor is regularly increasing.

Organized labor has achieved many worthy benefits. The right of collective bargaining is happily recognized. Men are entitled to its protection. Men should be free to join any worthy organization they choose. They may become members of C. I. O., the American Federation of Labor, their own Company Association, or they should feel free to join none of them. They should weigh the values against the costs. They should deliberate their benefits of freedom before they sign them away.

But whether they join an organization or not their spirit of procedure from that point on is of tremendous importance. Force and contention have never yet builded an institution, but they have wrecked them by the score. Whatever machinery is set up, there is no substitute for continued friendly understanding between men and management. In two thousand years no better platform has been built for the presentation of right relationships than the Golden Rule. But it must work both ways. It should be engraved on management's desk as well as on labor's bench.

Fortunately, industry is coming more and more to abide by that declaration in its treatment of men.

Provisions have been made for insurance, sick benefit, hospitalization, assistance in days of major crises, emergency loans, retirement and just compensation.

All of these things are becoming more and more securely established. Let's hope that they will call for the wholehearted, loyal, sustaining work from all who labor.

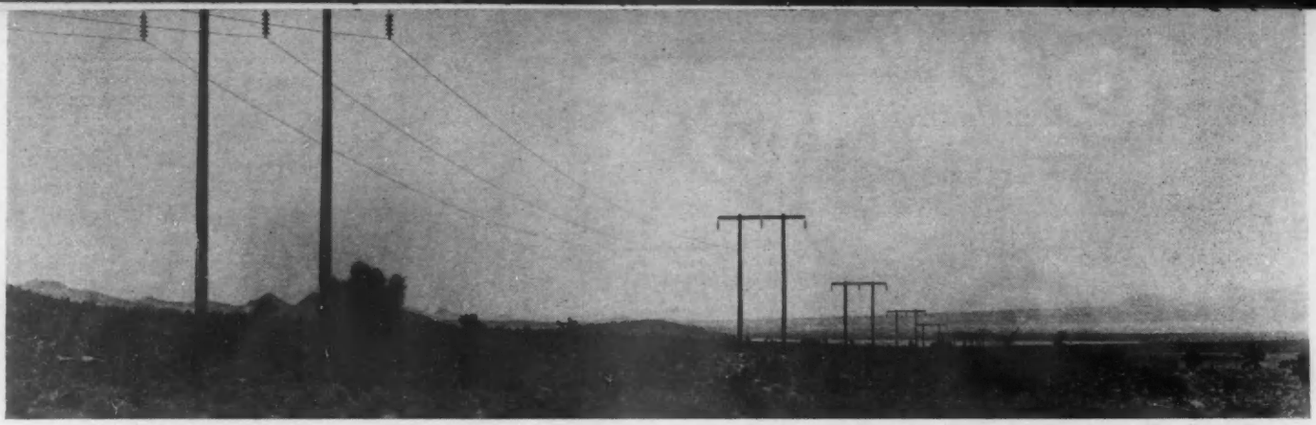
The men and women of the organization can save it as they have built it.

Recently I drove down from the eastern summit of the Sierra Nevada and stopped to catch the spirit of the monument to the memory of the Donner party. I stood in fascination before those perpetual figures of man, wife and child as they looked up out beyond that precipitous summit with a hope and courage that knew no defeat.

That monument bears witness that when a band of pioneers were caught in a terrific blizzard in the winter of 1846-7 as they trudged their way into California they kept on, in the face of odds that smacked of calamity, as few others have in this world's history. Caught before those precipitous mountains—snowed in in from 30 to 40 feet of snow—starving because of the total lack of food—driven to the extremity of sustaining life from human lives already lost—against all these odds—did they quit?

Fifteen hardy souls dared the terrors of those mountains to summon relief. It came too late for 42 out of the 90 who either starved or froze to death—but 48 were saved to write a heroic note into the settlement of California that beggars description.

Monuments are built to men of courage. Institutions are built by them.



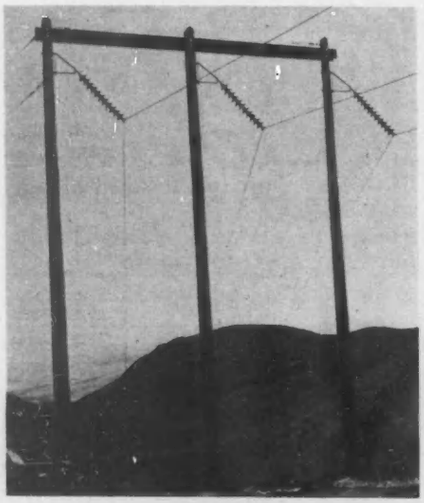
Boulder Power Reaches Pay-Dirt

By H. W. CROZIER
Consulting Engineer, Las Vegas, Nevada

TRAVERSING 165 miles of desert valleys, lying between high mountain ranges to the north of Boulder Dam, is the Boulder-Pioche transmission line, energized through temporary equipment last September now rapidly approaching completion. Main purposes of the line are to serve the important Pioche mining district where complex silver-zinc-lead-manganese ores are extensively worked, and to provide opportunity for large-scale electrometallurgical developments near the Boulder end of the line in Las Vegas Valley.

It was the importance attached to the future of this Las Vegas region which determined the use of double-circuit steel towers over the first stretch of line, leading over the cliffs of the Black Mountains from the deep canyon of the Colorado River. Here the initial construction problem was encountered, for so many lines already had been built that room remained for only one line of towers along the shores of Lake Mead, with spans across several arms of the lake.

Top of page—40-mi. tangent across Delamar Valley; Dry Lake, which surprised construction crews by turning wet, can be seen, 5 mi. away. This is the standard, two-pole construction. Below—Same camera point as above, line drops into Maynard Pass. Three-pole angle structure has 138-kv. insulators. (For steel tower construction see front cover)



Built by the Lincoln County Power District No. 1, a quasi-municipal corporation of Nevada, the line is part of a state-wide plan to utilize Nevada's 18¾-per cent share of energy made available by Boulder Dam. Energy is being furnished from the four 82,500-kw. units being operated by the Los Angeles Bureau of Power & Light in the Nevada wing of Boulder powerhouse, but eventually it will come from units to be installed on the Arizona side.

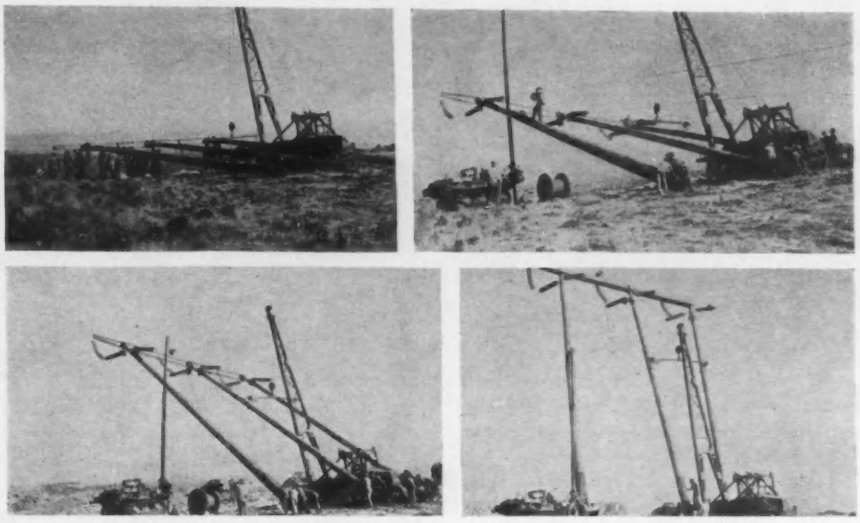
As approved by PWA, the job consisted of building a 69/138-kv. convertible transmission system, with 22-kv. distribution, together with main-line step-down transformers and distribution transformers and main-line and distribution substations. Main-line conductors were authorized of such diameter and spacing as to be convertible to the ultimate 138 kv. Approval was, however, granted only for 69-kv. transformers, so that when voltage is raised these will have to be replaced. Switching equipment is 138-kv., and the line is built for this voltage, except that when converted, about $35,000 worth of suspension insulator units will have to be added.

Present capacity, with reasonable stability, is 5,000 kw., which may be increased to about 9,000 kw. by installation of synchronous condenser equipment at the receiver end.

Energy transmitted by the Boulder-Pioche line is purchased under a 20-year contract with the Colorado River Commission of Nevada, at 2.59 mills per kw.-hr. The Commission in turn has a contract with the U. S. Bureau of Reclamation.
Financing included issuance of $564,000 worth of 22-year, serial maturity, 4-per-cent revenue bonds, $264,000 of which were bought by PWA, and a $336,000 PWA grant—total $900,000. Work commenced in October 1936.
Contractors: The W. E. Callaghan Construction Co. handled general line erection, Fritz Ziebarth the erection of steel towers and distribution line construction.
Eventually the line may be extended to the copper camps in White Pine County, near Ely, 110 miles further north.

After leaving the first few miles of rugged country, the line is carried on two-pole wood towers. The 50-ft. poles used on level ground are set 7 ft. in earth and 5 ft. in rock. Clearance is 23 ft. in the valleys, 2 ft. less at some points in mountainous country. Spans vary from 565 ft. standard to 1,200 ft. maximum.

Conductor is hollow copper, half being General Cable Co.'s 0.655-in. diam., H & H, made of six interlocking segments, the other half being Anaconda Wire & Cable Co.'s model No. 50, 0.65-in. diam., I-beam type, both being equivalent in copper area to No. 0000. Used for the first time was a new suspension clamp, designed to reduce conductor fatigue at the edge and at the same time present the advantage of light weight.



Up goes a three-pole angle structure. 1—Pole-hole digging machine coming up the hill at extreme left to help. 2—A good start. 3—Beginning to move in the butts. 4—Ready to drop in the holes

Suspension insulators on the main portions of the line have but five 10-in. units. Four more will be needed upon conversion to 138 kv. However, at horizontal dead-ends, angle structures and points where connections are made to switches, eleven 10-in. discs, sufficient to carry the ultimate voltage, are used. Sectionalizing switches for testing are located at three road crossings.

In order that the line be strictly abreast of developments in safety practice, equipment was selected and arranged to facilitate the practice of modern safety methods and the use of safety live-line tools.

Branch feeder lines aggregating 60 mi. radiate at 22 kv. from Prince substation, located 4 mi. west of Pioche. These are conventional, with triangular configuration, spans of 300 ft. standard, 700 ft. maximum. Conductors are of hard-drawn copper with pin-type insulators and lead-threaded steel pins. Medium construction standards are used up to 6,000 ft. elevation, heavy loading above.

Substations

Main-line substations employ 138-kv. air-break switches and pyrex-glass, liquid-filled, inclosed fuses. At Prince substation, at the terminus of the line, are four 1,666-kva. transformers, 69/22-kv. Y, with a 2,400-volt tertiary winding, delta-connected, also used to supply the station auxiliaries. Integral, tap-changing-under-load regulators, with 15 per cent range, are attached to each transformer. There are six 22-kv. oil-switches, two of the high-speed reclosing type, and the necessary complement of disconnecting switches to protect the six feeder circuits, each being guarded by three type-CO relays mounted on the station switchboard.

Delamar substation, located about two-thirds of the way from Boulder Dam was installed to supply mining and milling loads. Equipment consists of three 200-kva., 69/12-kv. transformers, delta-delta, and a 12-kv., three-phase, automatic regulator having a 15-per cent range. Three-shot, air-break inclosed fuse switches are installed on two feeders, one serving the four-mile line to Delamar, the other spare.

Equipment on the branch feeders from Prince substation includes one 1,000-, one 600-, and two 450-kva. distribution transformer banks, installed in distribution substations. Each has 22-kv. air-break switches and porcelain inclosed fuses. Some mines supplied their own transformers, some installing 22/11.5-kv. auto-transformer banks to serve equipment previously operated by diesel power.

Metering generally is with polyphase, double-element power meters, fitted with 15-min. maximum demand indicators. Most of the metering transformers are of the oil-immersed type, having both potential and series coils in one case. This arrangement was employed as a precaution against lightning damage, a menace because of the severe exposure in the 6,000-ft. mountainous country which surrounds.

In accordance with the practice whereby the U. S. Bureau of Reclamation procures and installs all generating, switching and transforming equipment at Boulder Dam, for account of energy purchasers, there are now being installed: four 10,000-kva. transformers, 16,500/69,000-volt-Y step-up transformers with automatic tap-changing-under-load equipment, switches, a transmission line across the canyon above Boulder Dam, and a terminal switching station for the account of the Colorado River Commission of Nevada. When completed, this switching station will supply the Boulder-Pioche line.

Energizing

When starting day rolled around the question of how to provide communication had to be faced—Pioche had no long-distance telephone, no operating telephone line had been built, and carrier-current equipment had not yet arrived. However, Western Union's Pioche office could be reached by messenger, and at Boulder City its office could communicate by local telephone to the Boulder powerhouse switchboard. By fine cooperation of the telegraph company, five-minute dispatch was obtained, permitting expeditious exchange of written operating orders between Prince substation and Boulder Dam.

Although there were four transformations between Boulder and the distribution system at Pioche, three of them temporary where intermediate taps were used and line excitation had to be allowed for, distribution voltage proved

Prince substation, 156 mi. from Boulder Dam. In the foreground are the 22-kv. oil switches and secondary outgoing circuits

to be exactly as calculated. The line was put in service the first day, and by the end of the week mines and mills were connected and running.

Now being built by the U. S. Bureau of Reclamation is a steel-tower line, using aluminum-steel conductor, from the Arizona wing of the Boulder Dam powerhouse to a terminal substation on the Nevada side. The line runs straight up the canyon walls on the Arizona side, then upstream to a high point well above the dam. A 2,200-ft. span crosses the canyon on the way to the substation, a mile from the rim. When completed, this line and substation will be a part of the permanent link between Boulder and Pioche.

Carrier-current telephone equipment, being furnished by General Electric Co., is scheduled for service this month. With this in operation the line proper will be complete.

Contemplated for construction this year is an electrolytic zinc refinery near Las Vegas. The second circuit, which the first 1½ mi. of steel towers are equipped to carry, probably will be run to serve this load.

Meanwhile the line serves these connected loads:

Pioche and Vicinity	Kw.
Combined Metals Reduction Co., Pioche	450
Combined Metals Reduction Co., Castleton Tunnel	900
Pioche Mines Consolidated	250
Pioche Light & Power Co.	120
Prince Con. Mining Co.	300
Bristol Silver Mining Co.	196
Comet Coalition Mining Co.	68
Panaca Power Co.	20
Caliente Public Utility	100
Delamar District	
Caliente Cyaniding Co., Delamar Mill	230
Delamare Co-operative	40

Building the Boulder-Pioche line is only the first step towards utilizing Boulder power for mining, electrometallurgical and electro-chemical purposes. Established at Boulder City by the U. S. Bureau of Mines, is an electrometallurgical laboratory. One of its first tasks has been the production of a new electric-furnace product—low-carbon ferro manganese—from local ores. Although abundant, these are of intermediate grade, but work so far indicates that refining at the source will prove commercially feasible. Electrolytic treatment of zinc points the way to another power market. Although established electrolytic plants are not likely to enter the region, the development of new products plus the proximity of power to ore indicate its potentialities as an extensive, electrified metallurgical center.

Systematic Voltage Change

Avoids Complaints

By F. B. DOOLITTLE
Distribution Engineer
Southern California Edison Co., Ltd.

CARRIED out by the Southern California Edison Co. last year in a manner such that the public was scarcely aware anything had occurred was the change from nominal 115- to 120-volt service. It applies generally to all regulated circuits which are primarily for lighting service in built-up areas.

Significant is the fact that almost no complaints have been received. It was necessary to furnish bucking transformers to one theater for rectifier equipment which was rated at 220 volts and would not operate on 240. A half-dozen complaints were received in cases where radio repairmen had checked voltage on receivers, and one radio amateur made his own adjustments when advised of the change. Considering the number of customers affected, complaints were negligible.

To accomplish the change it was necessary to change the taps on the 4,150-volt transformers at 45 substations, in order to bring bus voltage within the range which would allow the voltage regulators to maintain desired voltage at the feed points. In several instances temporary transformer banks were needed to carry the load while taps were being changed, but in other cases it was possible to carry the load from other stations during light-load periods.

In order to avoid changes of noticeable magnitude, the voltage regulators were adjusted in steps of not more than 2 volts, at intervals of not less than one month. This required adjustment of 409 voltage regulators, two to three times each. However, the big majority of adjustments were made during routine inspections, when adjustment would have been needed to the old voltage in any event, so that not more than a fraction of the time for this operation can be charged against the change.

Under the old standard, voltage actually ran as high as 118 in many instances. Under the new, voltage at customers' meters will run between 118 and 122, approximating 120 volts under light load, and varying somewhat according to the scheme shown in Fig. 1 under heavy load.

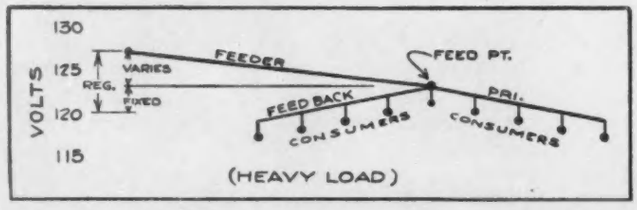


Fig. 1

Under the new scheme, Edison's voltage will match that of the Los Angeles Bureau of Power & Light, thus offering customers of both the convenience of having one standard voltage lamp.

While 115-volt lamps remain in service, the company may experience a slight increase in load. To prevent a reflection of this in increased consumption, the change was timed to coincide with the early summer period during which the load was diminishing according to seasonal trend.

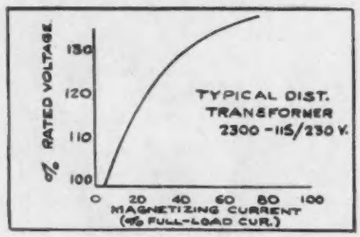
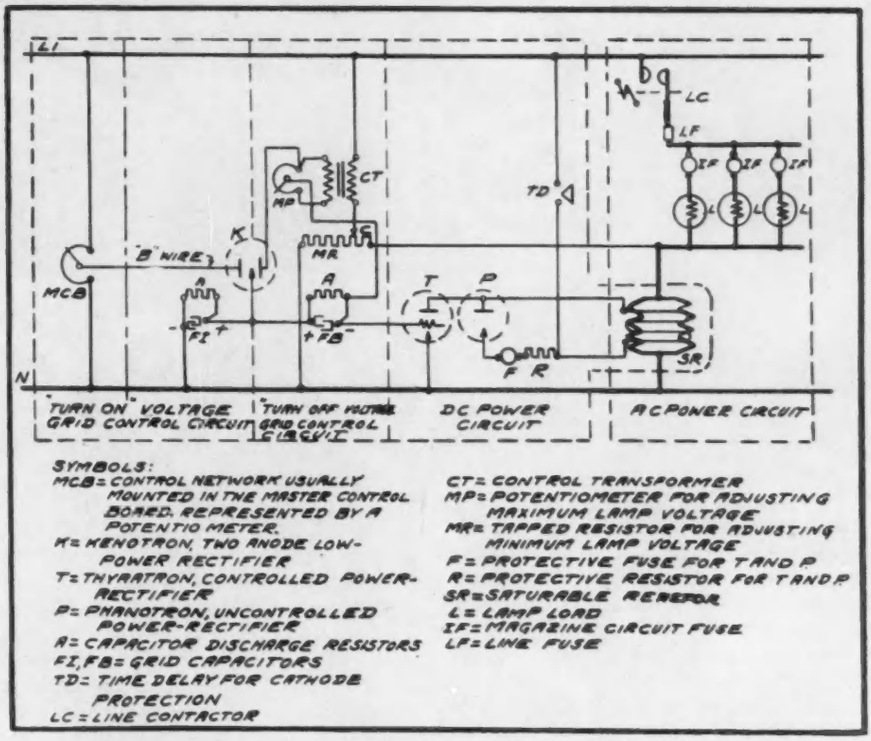


Fig. 2

In general, the change will probably result in faster and from the customer's standpoint more satisfactory performance of heating and cooking appliances at no increase in cost because the same heat will be released in less time.

No change has been made or contemplated for rural distribution where lighting is incidental to agricultural power. Voltage on many such lines, however, is such that the customers get 120 volts. Similarly no change is contemplated on 11 or 16-kv. circuits. Here also, lighting is incidental, these being primarily for industrial power.

It is expected that some increase in losses will be experienced. For example, by referring to Fig. 2, it can be seen that a small increase in voltage will cause a considerable increase in distribution transformer magnetizing current. However, the increase involved is well below the knee of the curve.



Vacuum Tubes in Action

IX—Controlling Lights

By H. C. STANLEY
Asst. Engineer, General Electric Co.
San Francisco, Calif.

THE combination of vacuum tubes and saturable-core reactors has provided a very valuable contribution to the art of decorative and theater lighting.

This system was first developed to control dimming of lights on stages of theaters. In order to dim lights by the resistance method it is necessary to use banks of rheostats. This results in heavy rheostat losses, and also requires a large installation, as the number of circuits may be over 100 at 30 kw. each. Power losses can be largely reduced by the use of reactors instead of rheostats.

However, the use of a saturable-core reactor obviates the necessity of any mechanical manipulation, as its reactance is varied by changing the degree of saturation in the core by passing direct current through a special winding. A four-legged core is used as shown in Fig. 1.

There is one a.c. coil on core leg A and one a.c. coil on core leg B. These windings are shown connected in multiple, but are wound in reverse directions, so that when a.c. flux passes up leg A an equal amount passes down leg B. A third winding passes around both legs A and B as a unit. When d.c. current is passed through this winding the flux created by this current passes through A and B in the same direction and completes the circuit through the outside legs. Inasmuch as the sum of the a.c. fluxes in the two inside legs is zero, as far as the d.c. winding is concerned, the flux created by the a.c. current does not build up any voltage in the d.c. winding.

By passing d.c. through its winding the legs A and B can be saturated to any desired degree. When no d.c. is passed the d.c. winding has no effect, and the reactor presents full reactance to the passage of a.c. When the core is fully saturated by d.c., the reactor presents minimum reactance to the passage of a.c. The reactance due to passage of a.c. is determined by the change in flux value as the current reverses. However, when the core remains saturated, a change in current has very little effect on the value of flux, so that the reversals of current take place with little induced counter E.M.F. The a.c. and d.c. windings are so proportioned that a small direct current is sufficient to prevent any important change in flux by the alternating current.

Thus by controlling a small direct current the amount of a.c. can be determined. The lighting circuits are connected across a.c. mains with a reactor in series with each circuit. Fig. 2 shows how three small vacuum tubes can be used to control a lighting circuit consisting of three-lamp loads.

When the thyration T, is conducting, current passes through the d.c. winding

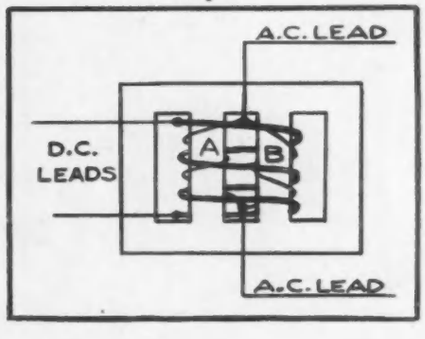
Fig. 2

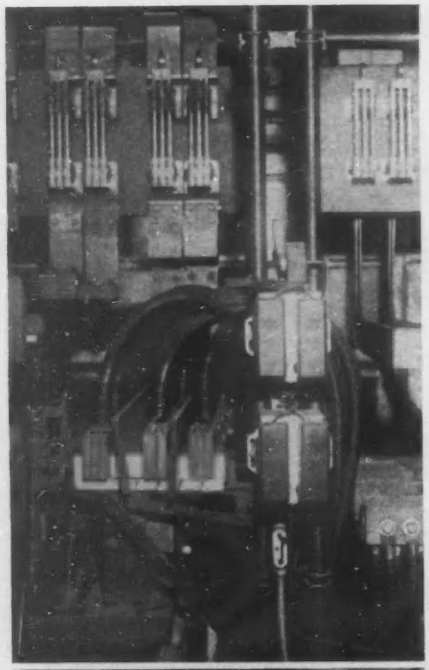
of the reactor at any value as determined by the grid voltage. However, this tube passes current in one-half cycles only, the flow being from L_1 through the reactor and then through T to N. On the negative half-wave the induced voltage across the reactor causes current to discharge through phanotron, P, thus effecting continuous current. Kenotron, K, has two anodes, the voltage of one being determined by the setting of potentiometer M C B. Flow of current through this anode builds up a voltage across the left-hand resistor A which tends to make the grid of T positive. Current flowing through the control transformer C T as determined by the setting of resistor M R builds up a voltage across the secondary of C T, causing current to flow through the right-hand anode of K and back through right-hand resistor A. The drop of potential across this resistor tends to make the grid of T negative. The primary of C T is also connected across the lamp circuit which stabilizes the lamp voltage, as an increase in lamp voltage increases the flow of current through the transformer C T with a corresponding lowering of the potential at the grid of T. This decreases the flow of direct current through the reactor, thus reducing the reactance with a corresponding reduction of lamp voltage.

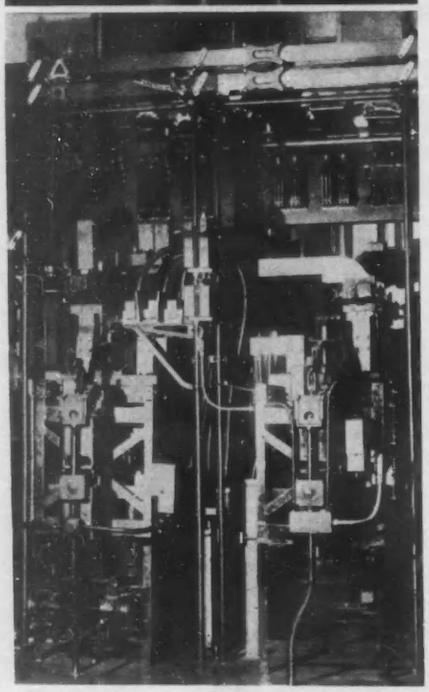
A small induction regulator may be used in place of potentiometer MCB and located at the control board. The setting of this regulator will determine the lamp voltage. A large number of circuits can be controlled from the control board in any sequence that may be desired. In decorative lighting, changes in color and in intensity can be automatically effected.

The main purpose of this chapter is to show how comparatively large blocks of alternating current can be remotely controlled by small amounts of direct current, and how the little vacuum types fit into the picture. The intensity of light can be smoothly controlled, merely by turning a knob.

Fig. 1







Pre-Built Bus Goes in Quickly

By AUBREY E. BULEN
Engineering Division
Westinghouse Electric & Mfg. Co.,
Seattle, Wash.

FABRICATION of 6,500 lb. of ¼x4-in. copper into an integral assembly of main-bus, circuit-breaker and disconnecting-switch interconnections recently, constitutes an example of the trend toward factory assemblage of such equipment in sizes commensurate with handling facilities at the customer's premises. This job was undertaken for the powerhouse at Shelton, Wash., which serves the city, three lumber mills, and Rainier Pulp Co., 600 ft. from the central station.

Expansion of facilities at the pulp mill necessitated additional bus capacity and associated switching equipment in the powerhouse and additional cables running to the pulp mill. Because the processes of pulp manufacture are inherently continuous and closely coordinated, it is imperative that mill equipment be as reliably powered as possible. The central station supplying power must maintain continuous service. Likewise, additions to switching structure must be accomplished without accidental outage and with least possible interruption to power.

Space limitations on the operating floor led to consideration of mounting auxiliary bus and switches in the basement, but the idea was abandoned due to interference with steam and water lines and other equipment. The possibility of building up the existing main bus with more bars presented itself, but here again restricted clearances both mechanical and electrical, with the attendant hazards to plant, service, and personnel under "hot" conditions made it inadvisable. These factors and that of avoiding a long shutdown period with consequent loss of revenue, resulted in the plan of fabrication and assembly employed. Fig. 5 outlines the requirements and illustrates the arrangement of circuits, both before and after alteration.

Dimension data on the existing structure were carefully taken and drawings for the new equipment were correlated with it. A "dummy" or temporary framework of pipe was set up, with horizontal members simulating, and occupying elevations corresponding to, existing bracing pipes. To obviate the possibility of misfits in coordinating the new bus structure with the existing, three "stringer" pipes, running longitudinally with the structure, were placed on the horizontal braces and clamped temporarily. These formed the base upon which the uprights for the new bus-

Fig. 1—(At top) Close-up of pulp mill cables before alteration

Fig. 2—(Above, at bottom) Extended view of load end before alteration

Fig. 3—(At right) Partial plan of new structure looking toward generator end. "Stringer" pipes and open button feature obviated mechanical interference. Bars to right of center reinforce existing bus underneath through tie risers tailored from a phantom set-up. Bars were carried on horizontal supports conveniently above the mains and on disconnect pole centers, allowing simpled union in balanced leaves to and from the switch terminals

supporting framework would rest. To facilitate handling and shipment of the 30-ft. structure in completely fabricated sections as large as could be conveniently handled, the "stringer" pipes were joined at a favorable location to correspond with the bus bonds and threaded back about 3½ in. to allow complete run of the coupling when dismantling and reassembling during erection.

By using angle bracing between the uprights and "stringer" pipes, and lateral angle supports between the horizontal bus supporting pipes and uprights, an open bottom structure was obtained which could readily be lifted in sizable sections and superimposed upon the existing structure without mechanical interference or undue fitting.

The completed structure was shipped in sections by truck to the plant, and stored temporarily on the turbine-room floor in the sequence with which components would be placed in position.

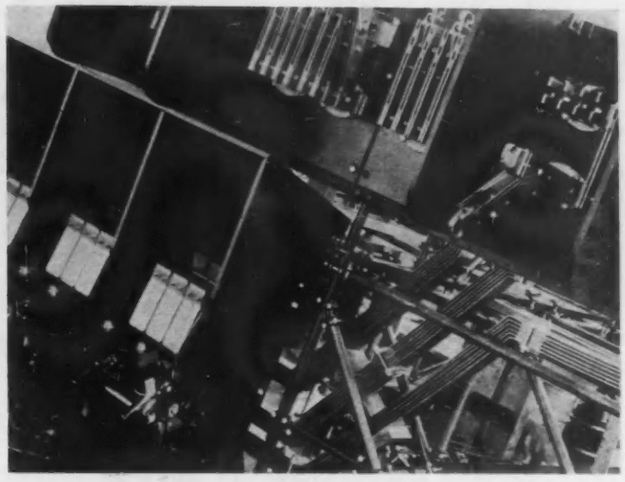


Fig. 4—Hooded arc barriers protect the frame and disconnect panels against burning. New 5,000-amp. disconnects (two 3,000-amp. switches per pole unit) and the new solenoid-operated carbon breaker with interconnecting risers are fabricated and braced as they would be in service

Great care was required in swinging the sections into position and lowering to prevent accidental short circuiting of apparatus. Veneer of three-ply thickness covering the top and sides of the existing busses was used to shield them against falling objects, and to afford protection from injury to the erectors.

The new disconnecting switch panel and interconnecting risers between auxiliary bus at load end (H Fig. 5) and existing oil switch (F), are illustrated in Fig. 6. Note the flat horizontal runs at right angles to, and forming a continuation of the mains, which were dead-ended on insulators not discernible and from which vertical cable drops were obtainable in contrast to those of Fig. 1. Verticals drop from the lower terminals with offset runs fabricated to a "phantom" oil switch simulating the actual. An interesting feature of the design of these particular risers developed from an 11-in. offset from breaker terminal to corresponding riser (required to give hook-stick appearance to other disconnects) functioning as sufficient "adjustment" gap, members of which closed the circuit traverse for the entire structure, and were the only ones made at time of erection.

It is increasingly common for new switching equipment to be factory assembled and shipped in integral units, thereby effecting economy in dismantling labor to the manufacturer and avoidance of reassembly expense to the customer. This example including major alterations and additions to existing equipment with consequent economy in cost and trouble to the purchaser is a logical extension of the idea.

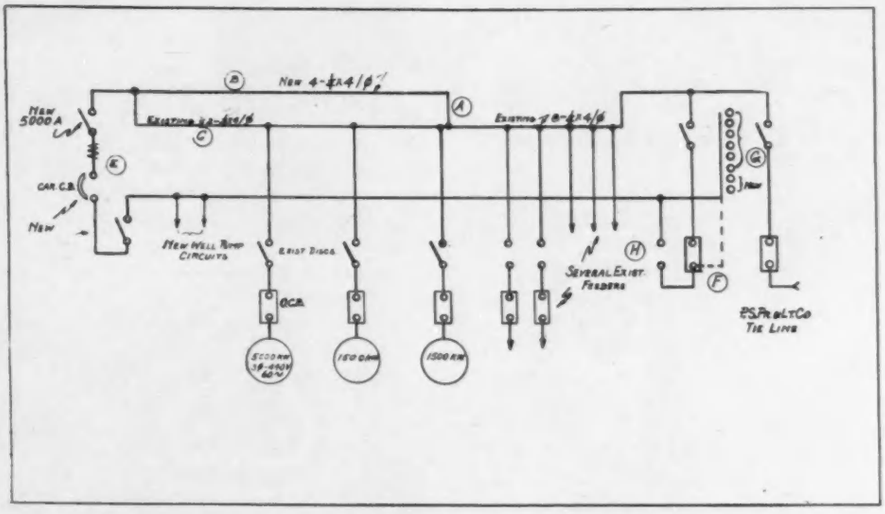


Fig. 5—Circuit arrangements before and after alteration. Power from generators through the original main bus was distributed to the feeders, most of it through oil switch F, and over dotted connection to six outgoing conduits (G), carrying six sets of 3-phase, 1,000,000-circ.-mil. cables to the pulp mill. To facilitate repair of F, also to relieve its load, a 5,000-amp. auxiliary bus was run the length of the structure, connected to F through new disconnects (H) and to main bus at E through new 5,000-amp disconnecting switches. Normally, main and auxiliary busses parallel the load, but it can be shifted to either at will. The carbon breaker may be isolated by disconnects at E

The author is indebted to Mr. Walter Kulrich, Chief Electrician of Rainier Pulp Co. and to Mr. Mackey, Superintendent of Reed Mill Co., for valuable suggestions and photographs.

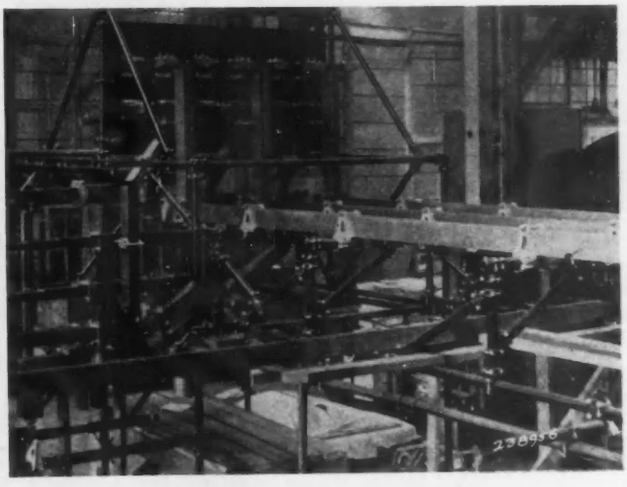
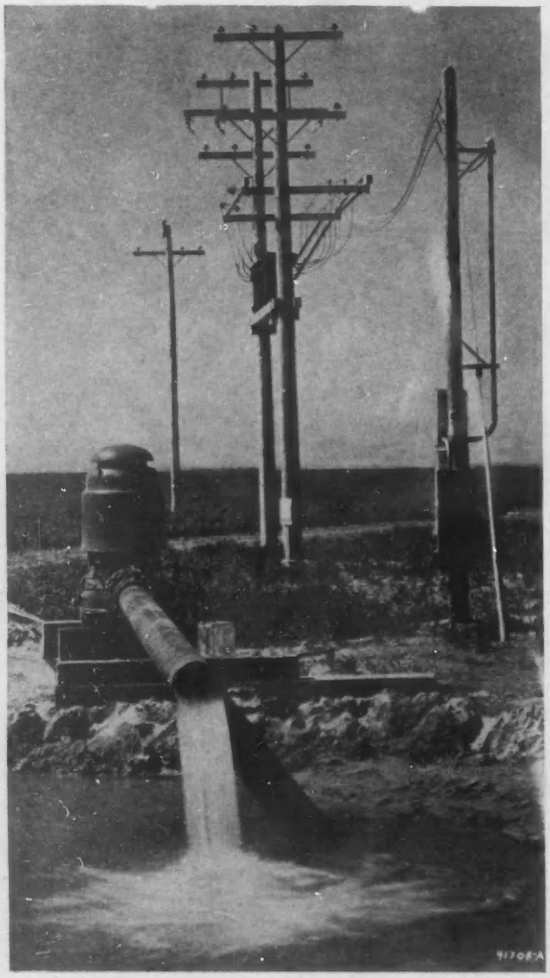


Fig. 6—Vertical risers to existing oil switch. One specification for the job was that accessibility to operating aisles at ends and rear of the switchboard be maintained. A "bridge frame" supporting the heavy risers and disconnecting switch panel permitted this to be met



Rainmaker's Riddle

Dollars and Sense Applied to Pole-Line Capacitors and Other Devices For Regulating Rural Lines

By H. H. MINOR
Distribution Engineer
San Joaquin Light & Power Corp.

MAN-MADE lightning is a phenomenon at which the public marvels. We, as engineers, know what careful preparations lie behind such spectacle. We know that these manufactured storms can be produced only when equipment and personnel stand ready, that they last but an instant, are destructive, dangerous. We realize the great practical and technical knowledge that goes into the interpretation of results, and we know that, to the industry, such research is good business.

Attracting but slight public interest is the equivalent of another kind of storm. To produce this storm likewise requires skilled workmen and engineers to design and place equipment. Unlike lightning, this storm must be ever-ready to break, capable of continuing indefinitely. It must occur, not in the laboratory, but throughout a great area of farms. It is man-made rain.

This man-made rain must also be good business, returning a profit to its manufacturer, proving of advantage to its user. To make such storms good business, many questions must be faced and answered—both by the serving agency and the farmer. To him, fertility of the land, selection of crops, possibility of frost damage, market conditions, initial investment and ability to carry on until the crop can be sold are problems of the first order. These must be analyzed by the serving agency as well. But in addition, the serving agency must plan distribution facilities, substations, transmission lines with an eye on the whole picture, as well as on the individual. It must be prepared to deliver the energy for rainstorms where and when demanded.

Meeting this demand, both present and future, meeting it in a profitable way, requires a careful estimate of growth. Frequently, rural developments start in a small way, grow gradually. For the most part this is true in the San Joaquin Valley. But in the map is an area which grew up almost overnight.

It is a fairly level expanse, lying between the Southern Pacific R. R. and the foothills to the east. In 1936 it was, for the most part, vacant. Old timers said, "It is good land, but without water." At the same time, nearly everybody there was planting cotton or wishing he could.

Then an enterprising firm of farm operators quietly acquired some nine sections of this land, moved in well-drilling outfits, and started to dig. They applied for electric service for thirty-six 75-hp. motors scattered over the area. They would expect service in March 1937.

The area was almost midway between two substations, each 12 line-mi. away. One had installed transformer capacity sufficient to serve the proposed load, but distribution facilities to reach the load were almost wholly lacking. The other had but little available transformer capacity.

The business was attractive but of a more or less speculative nature. Cotton was to be the major crop. Water possibilities were unknown. Other loads, should the farming project fail, were not likely to develop.

Distribution lines to serve some 3,500 kva. of load 12 mi. from the supplying substation plus radiating lines to cover the area meant a huge investment. In

case of failure, salvage value less labor costs would not be high.

A transmission line was available not far from the western boundary of the area to be served. A substation might have been built and the distribution cost greatly reduced. But building even a more or less temporary substation would have cost more than building the distribution. Possible salvage would have been greater for the substation, but either would have resulted in a considerable loss in case of removal.

The question, then, was how to serve this rather large load adequately with the least possible permanent or non-salvageable equipment.

Earlier experience with the use of step-voltage regulators to improve service over long lines pointed to their use as a possible solution. A careful survey of the area and some preliminary calculations confirmed the idea.

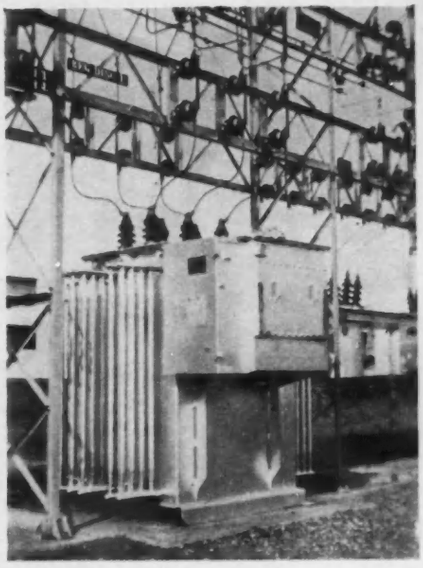
The expected load was 3,500 kva. Probable unforeseen increase might account for 20 per cent more. It was felt that a little more load might develop if the project succeeded. Therefore, it was decided to prepare for 5,000 kva.

A regulator station designed for this excess capacity, was installed 10½ mi. from the substation. A twin-circuit, 1/0 copper line was constructed between the substation and the regulator station. These two circuits were operated in parallel as one line, as an isolated feeder for the regulator only. Therefore, voltage fluctuation and voltage plane or level did not matter on that line. All that was necessary was that the spread of voltage between no load and full load would not exceed the regulator range.

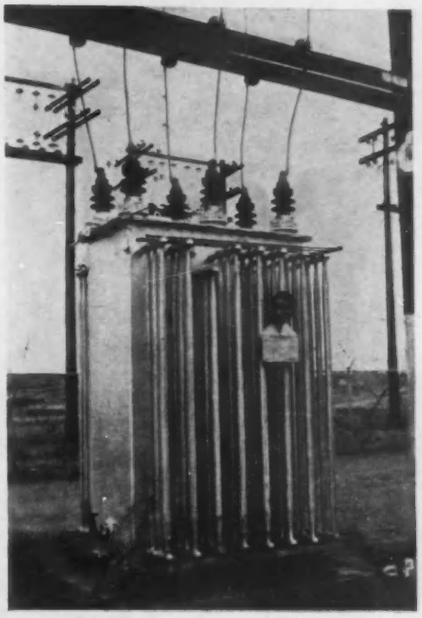
Although losses over this feeder would of course be high, the short load season would somewhat discount their yearly effect. Bus from which this feeder was supplied was adequately regulated so that no lowering range at the regulator was required.

From a line drop standpoint it was evident that the higher the voltage on this feeder, the less the drop. To a greater extent, the higher the voltage the lower the losses. Twenty-per-cent drop and therefore 20-per-cent regulating range — all boost — was decided upon.

Step regulators were available with an inherent boost winding incorporated within to give any desired range. Such a regulator with a 10-per-cent raise and lower regulating winding and a 10-per-cent fixed boost would have had the required 20-per-cent raise range. The feeder voltage at the supply side of the regulator would have been normal at no load (in this case 12,500 volts) and 20-per-cent below normal at full load.



Instead of such a regulator, a standard machine with 10-per-cent raise and lower range was decided upon, and



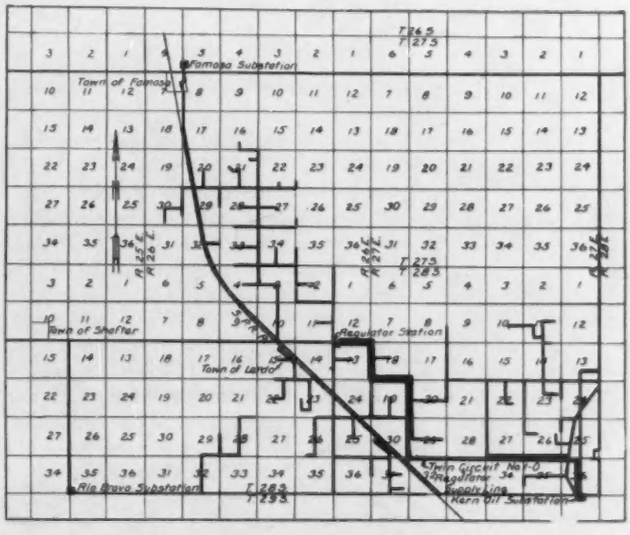
Top—Three-phase booster transformer at supplying substation. Bottom—Step voltage regulator, 10½ mi. from supplying substation

a separate, three-phase, 10-per-cent booster transformer was purchased. This booster was installed at the supplying substation in the line feeding the regulator station. Thus its voltage was raised at the source to 13,750 volts, and the resulting voltage at the regulator was 10-per-cent high at no load and some 7½-per-cent low at full load on the regulator. This raise of voltage plane by 10-per-cent resulted in approximately 10-per-cent less drop and almost 20-per-cent less loss at full load than would the other type of regulator.

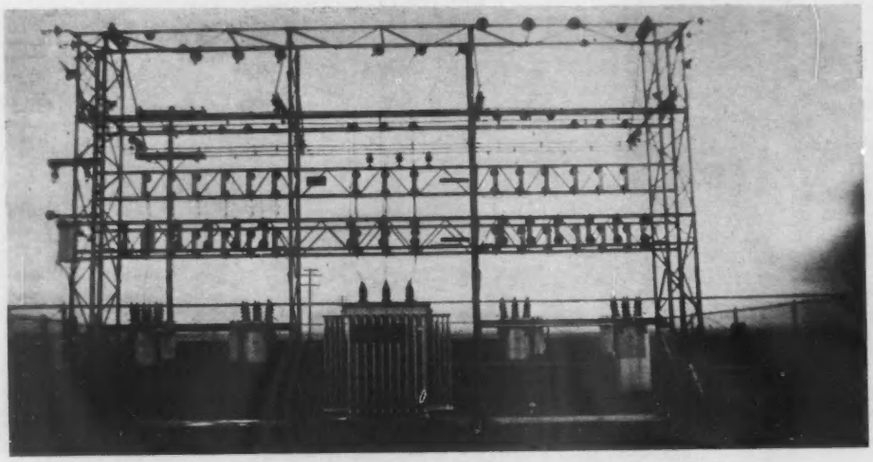
From the regulator station four feeders radiated, covering the territory and tying into feeders from adjacent substations. In effect, the distribution bus at the supplying substation was extended 10½ mi., with an effective load-limiting reactor in the form of the feeder circuit included,

Automatic reclosing circuit breakers were installed on the outgoing lines. Voltage conditions proved very good and service was ready when called for. The rain-storms were delivered when desired.

Much of the equipment and facilities installed was almost 100-per-cent salvageable. The booster transformer and regulator could be disconnected and moved intact. The distribution lines, other than the twin-circuit feeder, would have been necessary whatever plan was used. The twin feeder was built in part on existing poles and the balance of its pole line was used for a feeder from the regulator station. Thus, even it would not be a total loss if the load failed in part. It was felt that the in-



Opposite page—at top, furnishing man-made rain; at bottom, the result, cotton, typical of the fast-growing area under discussion. At left—scheme of the distribution area on the San Joaquin Light & Power Corp. system. Best means of serving its problematical future demands is discussed. It is typical of areas where line-type capacitors can be used to relieve overload conditions



Regulator station with four automatic-reclosing feeder switches

stallation was successful and adequate.

But this feeling was short lived. Other wells were drilled, more new land was leveled, plowed and seeded. More rainstorms were demanded. The load steadily increased until in early August of this year the load served by the regulator station reached almost 6,000 kva., a 20-per-cent overload. Load was shifted where possible to other lines but even so the overload persisted. The equipment stood the gaff, voltage conditions were excellent and there was no trouble.

Looking Ahead

But what about that reserve capacity so carefully considered? What about the water supply? What does the future hold?

The first question is already answered. The reserve capacity no longer exists. No harm resulted, however, if you except a few more gray hairs and sleepless nights suffered by the personnel of the serving company.

But what of the water supply? An ocean of water has been used, the water table has steadily receded. Are the farmers curtailing? Are they worrying? They alone can answer that, definitely, but they certainly have faith in their venture and plenty of guts. They are replacing all of their 75-hp. motors with 100-hp. units and are installing fifteen new 100-hp. plants. In addition, some 1,500 hp. is to be added by other operators than the original company.

The load is still more or less speculative. Is it good business to invest a large sum to serve this area, or is it better business to be conservative? Is the costly substation the best solution, or is it wiser engineering to wait and see what that water table is going to do?

The latter course seems best, provided that ample equipment capacity is available to care for another unexpected, unheard of load increase. That is, if such a course is possible.

About 3,500 kva. of new load is expected. It is a coincidence that this is the same amount that was originally planned. Will the parallel continue? Will this 3,500 stretch to 6,000? Possibly so. The sales people say probably so. Mr. Water Table may have the answer.

Those concerned with planning must overlook no condition that affects the problem. Conditions are present now that were absent a year ago: Other load areas have increased; the substation to the north of this area must be enlarged; the substation that supplied the regulator station is nearly loaded; power factor at that substation is low; additional condenser capacity is needed. The whole picture must be viewed before deciding what to do.

Increased capacity at the northern substation will allow some transfer of load. A third substation can be given a little more by an increase of line capacity. Thus, the load that of necessity must be carried by the regulator station is reduced to some 9,000 kva. considering that the 3,500 kva. expected does stretch to 6,000 kva.

A 50-per-cent increase at the regulator station will be required. That will mean three feeders instead of two, added regulator and booster transformer capacity and an overloaded substation at the supply end.

New Tools

But those are the same old tools, additional copper, more poles, more substation equipment. What about a new tool, or rather an old tool dressed up in a new way?

It was stated that condenser capacity was needed at the supplying substation. Why not present it with some at bargain prices?

Power factor of this load during peak was 82.3 per cent at the regulator station. Thus, the 9,000 kva. represents only 7,400 kw. If we had only 7,400 kw. to serve at unity power factor we find that no more copper will be required for our feeder than is now there. The twin circuit of 1/0 copper will result in only 17½-per-cent drop and the losses will be but little more than they were this year.

With the help of the newly dressed up tool, the pole-line-type capacitor, we can transform that 9,000 kva. to 7,400 kw. We can sprinkle that capacitance around where it will do the most good. We can install it at the load or very close to it.

These capacitors are now available in units of 15 kva. for various voltages. We might use 6,900-volt units, Y-connected, on our 12,500-volt feeders. However, the motors served in this area are mostly 460-volt, 75 or 100-hp. units, each supplied by a bank of transformers. Capacitors of 460 volts, installed on the secondaries of these transformers, will do the trick. To correct the power factor to unity, 5,000 kva. would be necessary. To be installed initially is 4,000 kw., more later if needed.

The regulator will need but 7,500 kva. of output capacity instead of 9,000 kva., and there will be some 1,500 kva. less load on the supplying substation.

$ $ $

Have costs been kept in mind? Has the whole picture been scanned?

The cost of the added copper and larger regulating equipment would be some $24,000. The 4,000 kva. of capacitors installed will cost $38,000. The difference is $14,000. The 4,000 kva. of "condenser capacity" is being sold to the supplying substation for that amount —at the bargain price of $3.50 per kva. installed, and some 1,500 kva. of substation equipment capacity is thrown in for good measure.

Thus, has a demand for man-made rainstorms in the San Joaquin Valley been answered. An engineering problem has been solved, a barren area has been made productive. Will it be a successful venture for the farmer and the power company? Only Mr. Water Table can answer that. The business is still speculative, but the trite saying "Nothing ventured, nothing gained" is still true. It applies to the farmer and to the power company. At least, in this case, man-made rainstorms are being delivered upon request at a very reasonable cost.

Acquiring 22,000 Horsepower of "Plus" Business

By V. A. BLOXHAM
New Business Supervisor
San Joaquin Valley Division
Southern California Edison Co.

THE copper networks of numerous electrical utilities stretch out to serve almost 75 per cent of the farms in California. For more than a generation rural electrification has been integral with industrial, commercial and domestic electrification in the steady development of many of these utilities. Electrical service is available to every established farming community except those in the remotest areas.

Unlike the east, middle west, and south there is in California no problem of selling the general merits of electricity for the purpose of promoting extensions into rural territories.

The problem today is one of profitable new loads. Load building cannot be separated from its inevitable companion, cost of serving, if the necessary low-priced energy is to be maintained for agriculture. To accomplish this desirable result the closest coordination between the utility's load building and load serving departments must exist.

It can readily be seen from the following break down of the essential factors of the problem that salesmanship and distribution engineering meet on common grounds:

1. Increasing electrical uses at existing farm services.
2. Adding profitable loads at new services on existing farm lines.
3. Fitting new loads into existing line and substation capacities.
4. Serving new and exising loads with the least capital outlay.

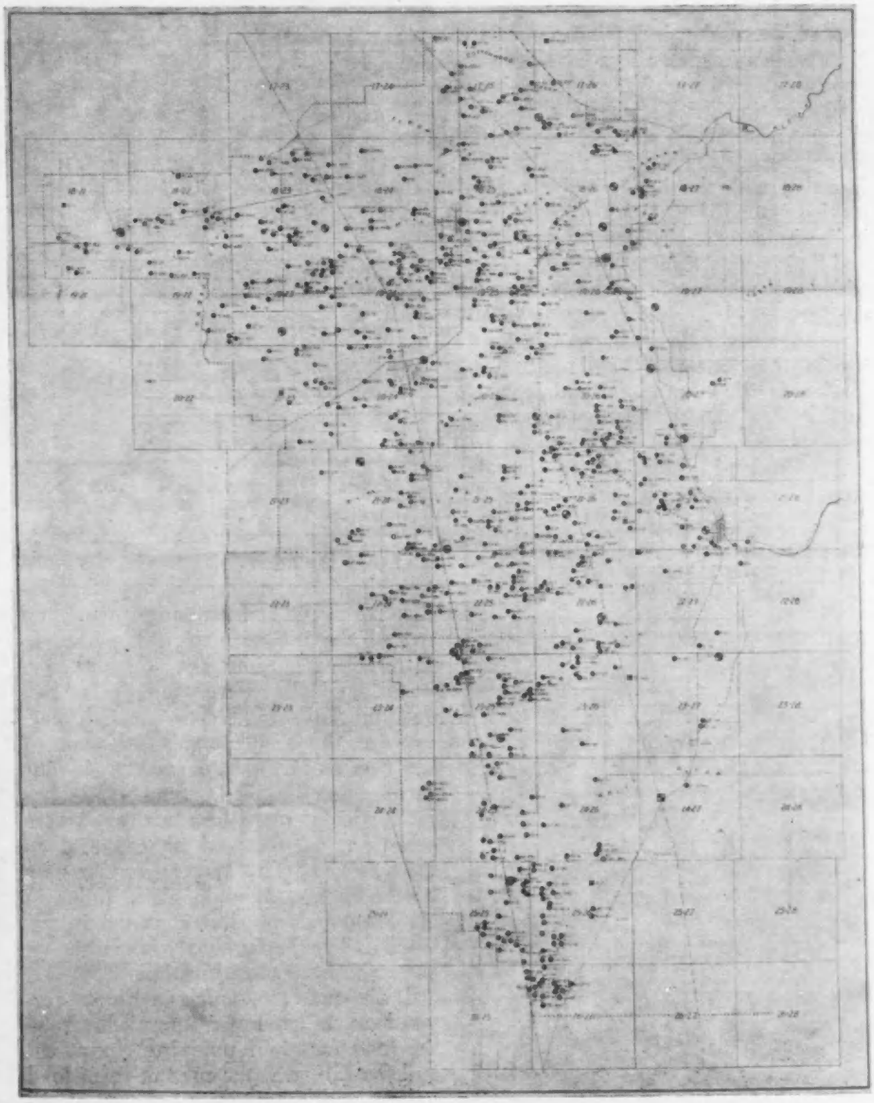
During the last two years several interesting and difficult problems have been encountered and solved in the San Joaquin Valley division of the Southern California Edison Co. These problems, strictly peculiar to the specialized agricultural conditions of the valley, were climaxed in the last October-to-October year. In this period approximately 22,000 hp. in new connections and plant increases were added in this valley territory. The new load was served from existing distribution lines or through short extensions to single installations. Furthermore, no increase was made in the installed capacity of any substation feeding the 11.5 kv. rural distribution network despite the fact that the summer load was greater by 10 per cent than the previous all time high.

The area served in the San Joaquin Valley division is in excess of 1,200 sq. mi. and includes seven cities of 4,000 to 10,000 people each, besides a score of towns and trading points. From a power standpoint the whole may be considered as agricultural.

In analyzing the selling and serving of this 22,000 hp. of "plus" load, consideration must be given several important factors. As might naturally be assumed, the forces behind a considerable share of these power sales were in the multi-phase upswing of agriculture. Other inherent and responsive factors within the company and its organization provided the vehicle on which this extensive and unpredictable increase in load safely arrived.

The accompanying map shows the geographic location of new load and emphasizes the even distribution of this load over the entire territory. The wisdom of careful study into the extent and direction of future rural load development before substations are erected is also illustrated by this map. Although the 23 substations that feed the total area were installed years ago to serve a steadily growing farm load, the pumping season just completed verifies the strategic location of these substations with respect to the placement of new loads.

As proven here, it is almost imperative that such basic farm values as soils, water geology and crop probabilities



As shown by dots, new load is evenly distributed

RURAL LOADBUILDIN

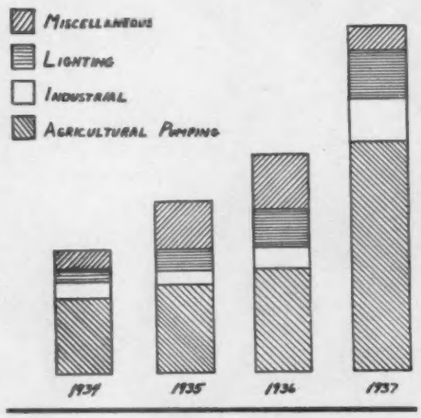
should have a definite bearing upon the original design and location of substation and distribution feeders. It is true that all variables cannot be known or all future trends predicted, but a thorough knowledge of basic farm conditions and local economic history is an invaluable aid to the utility in the economics of rural electrification.

The block graph represents the relative extent and diversification of new load obtained over a four year period. It is most significant that large increases in both industrial and lighting connections should occur along with that of agricultural pumping power. New people, new homes and new and improved places of business have followed the development of new irrigated lands and the intensification of crop production. New cotton gins, wineries and packing plants were built and the old ones improved and increased to care for the crop abundance.

It is true, perhaps, as Mr. A. C. McMicken has stated in the June ELECTRICAL WEST, that irrigation pumps for California's fertile valleys have been responsible for a high saturation of farm electrification in this state and its consequent profitable status. However true that statement might be, it does not follow that with the low-priced electrical service extended to California farmers, indiscriminate loads may be promoted and their proportionate service facilities added, all with profit to the utility and the farmer. Untimely increases in system capacities and excessive capital outlay in line extensions and customers' service facilities can easily defeat the continuance of the existing low farm power rates.

So called "plus" load is to a great degree the answer to capital outlay in service facilities both at the point of delivery and in the physical system lying back of the load, provided of course, that such load will at least in part wrap itself around existing loads rather than stack itself upon them. As stated in a previous paragraph the entire valley load together with its extraordinary 1936-37 increase was served by existing station equipment without impairment of the usual service continuity.

The degree to which last year's connections approached the "plus" angle with respect to line building is shown by an analysis of power loads. A total of around 900 connections was made with an average horsepower of 23.6 each. Agricultural power only dropped the average slightly to 22.8 hp. while industrial connections raised the average size to 29 hp. For each horsepower of major power load connected. 26.8 ft. of line was built. Agricultural power raised this footage to 31.2 ft. while industrial power was added with only 3.8 ft. of line per horsepower connected.



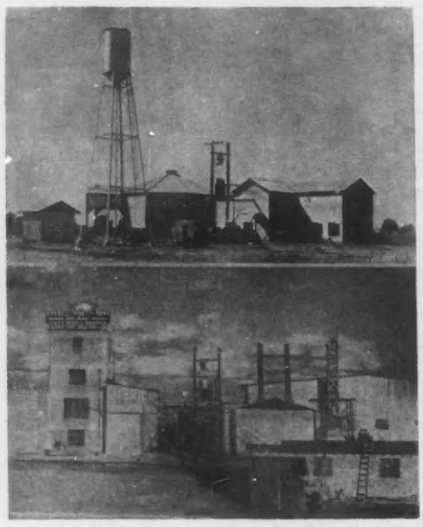
Extent and diversification of new load

While the facts here set forth are in no sense intended to represent a record breaking accomplishment, they are indicative of the endeavor to promote and extend the use of electrical energy to farm with a minimum capital outlay.

Although the coverage in the San Joaquin Valley is above the high state average, it is no longer sufficient to say that more than 95 per cent of our farms are electrified. Such claim has no particular merit in a territory where electricity is accepted as essential to farm values. The average farmer may have a 25 hp. pumping plant, lights in his barn and an electric range in his home and yet be far short of the ultimate extent of farm electrification.

It is not too much to look forward to a generous improvement in the load factor of pumping equipment and the filling of the present farm load valleys with the use of a hundred smaller devices now at hand and yet to come.

This cotton gin at Tulare, above, uses 170 hp. in motors and lights; the new A. Perelli-Minetti winery at Delano, 175 hp.



Developed to meet the 100,000-per-year chick requirements of the Childers & Hatch Breeding Farm near Arcadia, Calif., fifty outdoor brooders like those above brought chicks through last year's cold spell with 100 per cent results. Simplicity is the essence of the brooders' construction, the electric unit being a self-contained heater, reflector, light and thermostat connected to the service through a flexible plug. Correct wattage for maximum efficiency depends on variations in outside ambient temperatures

Rural Electric Conference To Be Held at Davis

Tenth annual Rural Electric Conference will be held at the University of California, Division of Agricultural Engineering. Davis, Calif., Jan. 10-12.

Speakers will include: Jan. 10—R. L. Perry, University, "Comparative Insulating Values of Various Types of Roofs;" F. A. Brooks, University, "Protection of Citrus Orchards from Frost Damage;" T. A. Wood, Pacific Gas and Electric Co., "Use of Fans in Dryers;" J. R. Tavernetti, University, "Handling Feed Molasses on the Farm;" J. C. Rear, Union Ice Co., "Precooling Vegetables," and C. D. Sublette, P. G. & E.

Jan. 11—V. Givan, University, "Selection of Irrigation Pumps;" R. L. Nourse and R. H. Cates, Southern California Edison Co., "Field Experiences with Irrigation Equipment;" K. K. Knopf, Westinghouse, "Types of Electric Lights." and D. R. Hoagland, University, "The Present Status of the Water Culture Method of Crop Production."

Jan. 12—B. D. Moses, University, "Recent Developments in the Electrical Pasteurizing of Milk;" W. R. Hinshaw, University, "Poultry Diseases and Their Control;" G. E. Kimball, Industrial Accident Commission, "Regulations for Farm Wiring and Equipment," and C. F. Dalziel, University, "Danger of Electric Sparks."

W. H. Parks will preside at the annual dinner Jan. 10. Speakers will be Mr. Moses and Arthur G. Dudley.

Sales Agreements

As offered appliance dealers by manufacturers are unsafe. What the dealer wants is assurance of a future.

By J. D. O'CONNOR*
Lupen & Hawley, Sacramento

AFTER studying the various kinds of sales agreements between dealers and manufacturers, one can come to but one conclusion. We need agreements which will assure the dealer or retailer definite sales outlets and, in some cases, greater margins of profit.

As they exist today, most sales agreements are very exacting with the dealer. They set up his territory; list the equipment he is to sell; stipulate that he make payments either F.O.B. factory or sight draft bill-of-lading; require him to maintain adequate offices, store-rooms and engineering forces; compel him to furnish the manufacturer with sales reports and other special reports which may be needed, and, occasionally, compel him to send employees at his own expense to the factory for training purposes.

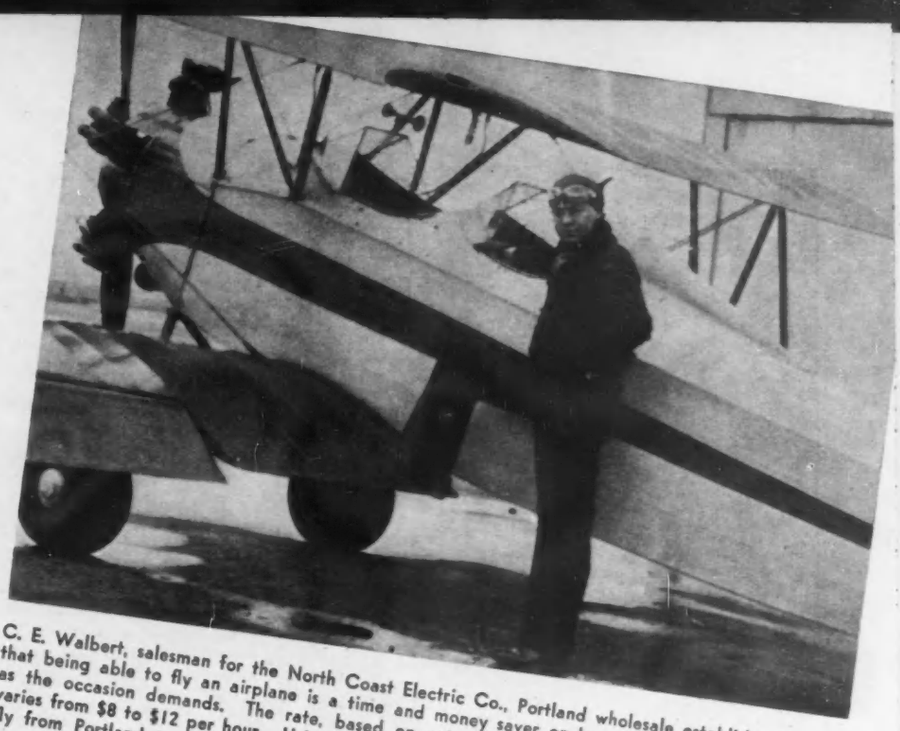
After complying with these requirements—and many others—for a few years, the dealer suddenly receives a notice from the manufacturer. In 30 days, the notice says, his dealership will be cancelled.

And so it goes.

Appliance sales agreements are not very valuable or even dependable in the present forms offered by most manufacturers. The manufacturer requiring a signed sales agreement does not seem to offer the dealer any greater sales protection or profit than the manufacturer not requiring a signed agreement.

The appliance dealer signs an agreement that he will use only a certain make of appliances but he does not find anything in the agreement stating that there will be a limited number of dealers in his city. The first thing he knows there are several such dealers, including garages, jewelry stores and what have you.

Lamp contracts are naturally a headache to everyone. There is only one reason for signing such a contract: It assists the manufacturer in keeping his mailing list up-to-date. It is hopeless ever to expect any change in the lamp business which might let the dealer or retailer realize a profit. The business has been spread to every drug, grocery, hardware and dime store.



C. E. Walbert, salesman for the North Coast Electric Co., Portland wholesale establishment, finds that being able to fly an airplane is a time and money saver on long jumps. He rents a plane as the occasion demands. The rate, based on actual flying hours and the power of the ship, varies from $8 to $12 per hour. Using his favorite "Fleet" plane above, he can—all in one day—fly from Portland to Pendleton, about 230 miles, take care of some special job and get back home before night-fall

Consider motor dealer agreements. Some of these are such lengthy documents that, off hand, one might think they included the key to the front door of the manufacturer's warehouse. But when closely read, one wonders if the dealer wouldn't be limited to standing across the street from the warehouse.

Present agreements restrict the dealer to various classifications of consumers in which he must confine most of his efforts to class A users. The dealer loses most of this business now because machinery equipment concerns sell the motors on the machine as well as separately. You will note that the machinery concerns do not confine themselves to any one particular manufacturer of motors, yet they are successful in securing the same discount from any manufacturer with whom they desire to place an order.

Motor agreements leave to the dealer only the consumers who are the greatest credit risks.

Sales agreements should be based on good business principles and commit both parties to specified responsibilities and limitations. The great word "WHEREAS" should be omitted from these agreements. They should state the territories, classify the consumers as to discounts and require both parties to adhere to all clauses. If any difficult sales problems arise, they should be settled by authorized persons from both parties within the territory, not by instructions written in eastern offices.

Neither party can consistently expect to change the agreements without the consent of the other party. There seems to be a constant desire on the part of manufacturers to make changes in the agreements, usually to permit certain consumers additional discounts or to classify them as direct buyers. In most cases this narrows down the dealer's prospective customers and reduces his profits.

If a dealer pioneers and establishes a market in a territory for the manufacturer, he should be protected against additional dealers or be compensated for his work by receiving a percentage on his sales for the past three years, the percentage being paid by the manufacturer or the new dealer.

Discounts should be well defined in the contracts. On some types of equipment manufacturers provide sufficient discounts. On others the discounts are not enough to permit a dealer to set up a sales and service organization.

Forty per cent discounts are necessary to sell most of the various equipments and appliances. There may, however, be some equipment running into large dollar value which could be handled on a considerably lower percentage.

High pressure sales methods with sales agreements "subject to change without notice" should not hold any interest for the prospective dealer unless he wants to assist others in building a large manufacturing volume without receiving his just share of the profits.

Until favorable sales agreements can be reached by the dealer and manufacturer in any particular line, the dealer should be justified in dealing free lance with whoever can supply equipment or merchandise.

*Presented at the convention of the Northern California Electrical Contractors Assn., San Mateo, Calif. Dec. 14, 1937.

To meet the never ending demand for southern fried chicken and biscuit, Coon Chicken Inn, Portland, has resorted to electrical cooking methods and installed the above battery of eleven Griswold fry kettles and two Griswold roll warmers. With the kettles consuming 4,000 watts each and the warmers 660 watts each, total connected load is 45,320 watts

Appliances

Hotpoint department heads and distributors get together at three Western shows.

As indicators of trends, the annual appliance shows which make "the circuit" rank high. This year Hotpoint's presentation set several precedents—it was designed primarily for distributors and their sales organizations (in Los Angeles dealers attended also) and it brought into the field the chiefs of every one of Edison General Electric Appliance Co.'s several departments, headed by Vice-President and General Sales Manager Ray W. Turnbull. The show, with its cast of 23 people, played three Far Western distribution centers—Portland, Los Angeles and Salt Lake—with attendance drawn from intervening sections.

Cynics who view with alarm the trend of manufacturers to place on the market complete lines of matched and tested appliances would have found an explanation for this development. As explained at these meetings the plan is but a logical step to securing and holding good dealers and at the same time enabling them to achieve a profitable, stabilized business. Advantages to dealers claimed include a saving of time (the dealer need no longer act as a purchasing agent), the mass effect of promotion—particularly advertising—and simplification of sales training, special merchandising systems and distribution.

Significant facts brought out at the meetings were: Successful merchandising, whether by manufacturer, distributor or dealer, depends upon products, policies, plans and people. Refrigeration saturation is estimated at 50 per cent with replacement sales approximating 10 per cent of the total. Investigation shows that 70 per cent of the cost of a refrigerator is represented by hidden features and that only 30 per cent of the cost goes into eye appealing elements. More and more emphasis is being placed upon sales training and sales tools on the theory that the actual point of contact between the customer and the merchandise is the weakest link in the distribution chain. Hotpoint has developed sound films, sales manuals and sales portfolios to overcome this weakness.

Almost every speaker appealed for a wider use of all appliances by every person in the industry. The statement was made that if the story of the comfort, convenience, economy and safety of electrical equipment was told to enough people—particularly as applied to the dishwasher, electric range and electric kitchen — the manufacturers would not be able to supply the demand with existing production facilities.

In the field of electric cooking the trend is toward more research which will permit greater standardization with consequent lower servicing costs and longer life. Demonstration is still one of the most effective ways of convincing the housewife of the flexibility and performance of an electric range. In a spectacular demonstration by Mary Schwin, head of Hotpoint's home service bureau, a meal was cooked on a range under a shower of water and a complete Christmas dinner was prepared on a second range completely enclosed in cellophane. Incidentally 40 pounds of turkey were roasted in one oven.

Hotpoint advertising will stress buying motives in one of the largest campaigns ever undertaken. Of particular interest on the Pacific Coast was an exhibit of typical Hotpoint national advertising dating back to 1907 which included copy on such early Western appliances as "El Toasto", "El Perco" and "El Grillo."

Announced for the first time was a Hotpoint sink and dishwasher in which a new garbage disposal unit may be incorporated at the will of the customer. Other new developments are covered in the new products section of this issue.

The three meetings were sponsored by Joe Platt, Harold Conklin and Bert Rowley, the Hotpoint district managers in this region.

Fresno Regulations

Ordinance adopted by the City of Fresno, Calif., more than a year ago to regulate the sale of certain electrical appliances has been amended to include all domestic electrical appliances. After Feb. 1 all appliances must have the approval of the Underwriters Laboratories.

Further provisions of the amendment stipulate that no unapproved merchandise shall be disposed of as a gift, premium or loan or rental; that all merchandise shall have a "maker's name, trademark or identification symbol placed thereon, together with such other markings giving voltage, current, wattage or other appropriate ratings as may be necessary to determine the character of the appliance."

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Training Future Buyers

Electric cooking is slowly being taken over by schools. Latest installation was made by Pacific Power & Light Co. in the Yakima, Wash., High School. Equipment includes nine Dorchester Hotpoint ranges and a General Electric combination electric sink with dishwasher and disposal unit.

During a class period 32 pupils can be accommodated in the kitchen. Eight ranges are used by students, the ninth by the domestic science instructor.

Indirect lighting provides proper illumination for each working space and range.

Even boys cook here

When the kitchen was opened, five classes of girls and one of boys were given instruction in the use of the ranges.

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Woolwine Lays Plans

Announcing a new type of electric kitchen heater which can be installed in place of one of the utility drawers, Woolwine-Norris Corp., Los Angeles, last month held a dealers' meeting at the Edison Company auditorium. Addresses by various members of the organization brought forth new develop-

Visitors inspect an exhibit at San Diego show

ments in the line of ranges, a detailed outline of advertising and sales plan for 1938. Carl Heintz of Heintz-Pickering Co., advertising agency, presented the latter.

Woolwine has added five new ranges to its line this year. Prices in southern California range from $91.50 to $249.50. The fan type electric kitchen heater installed in the utility drawer and controllable by the timer is listed at $25.

The sales program for dealers advocates using the kitchen heater drawer as a means of obtaining leads and prospects for more sales. A "dividend plan" is offered users of ranges who turn in names of prospects later sold by dealer salesmen. Urged to use such prospects to help them make their monthly payments or to help finance the new kitchen heater, salesmen are offered these incentives for more sales.

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Plumbers Back Water Heaters

Until recently the business end of the plumbing industry was limited to the sale of combustible fuel water heaters. This was a handicap to the merchant plumbers as well as the electric industry.

Now, however, the picture has been changed. At a recent mass meeting of merchant plumbers, manufacturers and officials of the Los Angeles Bureau of Power and Light, the Merchant Plumbers Assn. of Los Angeles pledged its organization to the aggressive merchandising of electric water heaters.

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"HOME OPERATING CONFERENCES," really miniature cooking schools with the informality and intimacy possible only in small groups, are being held by the home economists of Southern California Edison Co., in the San Joaquin Valley regions. Such conferences are held at irregular intervals usually at the home of some customer having electrical equipment. Number of guests is purposely kept small enough so that each person feels a responsible part of the group, asks questions freely, and receives an informal and friendly explanation of company policy, rates and answers in regard to problems arising from use of the equipment. Helen Kent, home economist, has been conducting such conferences.

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TO STIMULATE FURTHER the swing to electric cooking, R. B. Marshall, president of Electromaster, Inc., has offered five $100 prizes to operating utility retail salesmen who sell, lease or rent for their companies in 1938 the largest number of domestic electric ranges of a 7 kw. or more rated capacity. The contest will be conducted under the auspices of the Edison Electric Institute.

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Shows & Shows

Records fall at fifth annual San Diego Electric Show. Exhibitors talk larger quarters.

In the face of what is generally considered the worst business slump in several years the Fifth Annual Electric Show of the San Diego County Bureau of Radio & Electrical Appliances hung up new records in both attendance and sales.

So many people — 90,000 — visited the show during its five-day stand that exhibitors are advocating larger quarters for next year's performance. Selling success was equally marked, one I.E.S. lamp dealer reporting the sale of $1,500 worth of lamps through his display.

Although exhibitors were canvassed immediately after the show closed Dec. 5, no one reason can be given for the record-breaking performance. Answers ranged all the way from "better displays" to "generation of buying spirit through better interior lighting."

Better displays was undoubtedly an answer. Continuous demonstrations of washers and garbage disposal units operating under home conditions caused considerable interest, while one action demonstration, that of the Bendix home laundry, was virtually mobbed.

Interior lighting was also responsible in some measure, decorative candle lights in back of each booth serving as the integral—and, when the overhead lights went out on opening night because of transformer station trouble, life-saving—part of the scheme.

A nightly "man in the street" radio broadcast which gave visitors an opportunity to express their opinions of the show also contributed materially.

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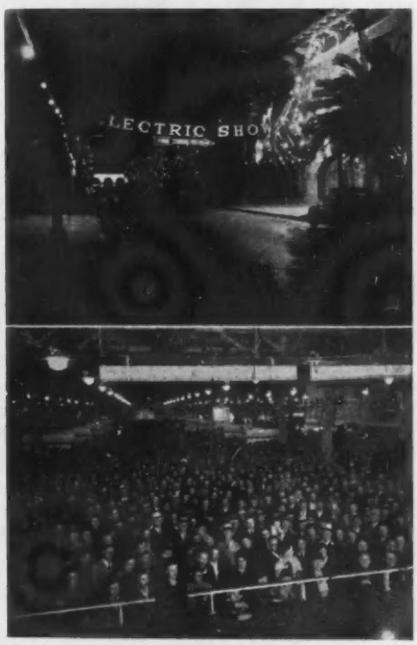

Scenes at San Diego

Four generations of one Denver family competed in the R. M. E. L. Electrical Exposition's mince pie-baking contest. Although only one of the quartet had ever used an electric roaster, all four turned out pies which not only ranked high in the judging, but pleased their own critical tastes

R.M.E.L. Defeats Weather

Showmanship won a battle with inclement weather and drew crowds aggregating more than 11.000 to the Rocky Mountain Electrical League's third annual Electrical Exposition at Denver Dec. 8-11. Zero temperature discouraged attendance the first two days, but the concluding days brought throngs which taxed the capacity of the Shirley-Savoy Hotel's convention hall.

As in preceding years, the slogan of the exposition was "Buy Something Electrical for Christmas." Proof of success lay in the fact that several exhibitors ran out of stock and had to sell from their display booths; distributors and jobbers were literally raided by retailers, and a number of re-order telegrams were sent to factories.

Exposition highlights, in addition to the mince pie-baking competition with electrical roasters as standard equipment for all entries, included a "Venus Silhouette" contest, winner of which was declared symbolic of the streamlined, ornamental electrical equipment on dis-

play, and a "Slumber Party" in which an artist's model demonstrated the electrical appliances which may be used in the modern girl's boudoir.

●

Winter Mart Scheduled

Western Winter Market will be held at the Western Furniture Exchange & Merchandise Mart, San Francisco, Jan. 24-29. Scheduled for introduction at that time is a number of important new models in the radio and electric appliance lines.

Highlight for visiting electrical dealers will be the seventh consecutive semi-annual Radio and Appliance Trade Dinner in the main dining room of the Mart Club Jan. 26.

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TO SHOW THE THOUSANDS of merchants assembling for Los Angeles' market week Jan. 17 how store modernization and proper lighting can increase sales, the commercial and industrial lighting committee of the Electrical Development League of Southern California is cooperating with the retail efficiency committee of the Chamber of Commerce in sponsoring a modern store display in the latter's exhibit hall.

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SIXTEEN THOUSAND FEET of floor space —enough to make possible the staging of an "electrical age exposition"—has been reserved for the electrical industry in the Southern California Home Show to be held in the Pan-Pacific auditorium, Los Angeles, April 21-May 1.

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WESTINGHOUSE NATIONAL home service and kitchen planning conference for 1938 will be held at Mansfield, Ohio, Jan. 19-21.

●

Table Talk

P. G. & E. meets to honor best salesmen and discuss plans for 1938. Shasta division wins Black award.

"Once in awhile it is good to call the family around the table and talk things over." Thus R. E. Fisher, vice-president in charge of public relations and sales, Pacific Gas and Electric Co., called to order the big dinner meeting of 500 salesmen, sales managers, agents and division managers, Dec. 17, in San Francisco's Palace Hotel. Purposely to award both the Black and Crawford trophies to winning divisions, the gathering of what Mr. Fisher called "the breadwinners" remained to hear the reasoning back of next year's sales quotas, program and changes.

James B. Black perpetual trophy to the division doing the best overall sales job of the year went to Shasta division, with a score of 110.4 points; San Jose and San Joaquin divisions rated second and third by fractions of a point. A handsome silver plaque, hand wrought in replica of the sculptured entrance of the P. G. & E. building, mounted on carved walnut, will carry the engraved

James B. Black trophy

name of each division winning. A certificate replica of the plaque is hung in the winning division headquarters permanently. Mr. Black and other members of the directorate were present, the former explaining his trophy and its purpose.

For the division sales manager whose staff performed the best dealer cooperative work during the year, the H. M. Crawford trophy was presented to San Francisco Division Sales Manager Frank Talcott. A modernistic carved bakelite statuette mounted on an electric clock, the trophy represents Prometheus' gifts to man and woman of power and light to lessen human burdens. In presenting the trophy Mr. Crawford said that the cooperating dealer advertising of 1937 represented a total of $600,000, 80 per cent of which was on electric appliances.

Salesmen of the company enjoyed a rare opportunity to see in action a specially written "California Tales" program by the N.B.C. cast that regularly broadcasts this P. G. & E. radio entertainment.

In announcing the 1938 sales expenditure budget of $1,209.000 with a revenue goal of $7,286,000, as against 1937's $1,748,000, expenditure budget, and $6,148,000 revenue, Mr. Fisher reviewed the revenue per dollar of sales expense from 1929 to 1937. In 1929 the revenue was $5.62 per dollar of sales expense; in 1930 it was $7.40; '31—$8.64; '32—$6.40; '34—$4.90; '35—$5.25; '36—$6.20, and 1937—$6.40. The 1938 revenue is estimated to be $6.33 per dollar of expenditure. With a more seasoned personnel, the prospect of a big housing activity, the exposition in 1939 calling for building front improvements and a good agricultural outlook, Mr. Fisher declared that the company's continued policy of selling to load up facilities, dealer cooperation and improved customer relations promised a sound future.

Al Joy, who had previously introduced the radio skit, pledged advertising support of the sales program in every particular. He likewise emphasized the advertising that is done for or against the company by the individual actions of every employee.

A new note was introduced by Hugh Crawford, general sales manager. when with lantern slides to project figures and charts, he outlined the sales outlook for 1938. Instead of giving details of the sales program he spoke rather of the reasoning back of the company's 1938 program and of the factors which had made it advisable to make changes in plan or activity. A survey of 480,000 customers and a study of load curves and types of load needed have been utilized in determining what types of business will be most sought in 1938.

Consequently lighting will be strongly stressed both in domestic and commercial sales. The minimum customer will be the goal of the domestic lighting drive. In the rural territories electric water heating and air heating will be developed more intensively. Interesting was the gas heating situation, which the company feels has almost fully loaded its facilities for winter business. To balance the gas winter load the company will give aid to more gas (steam jet) air conditioning business during the summer gas slump.

Total appliance business in 1937 was estimated at $40,000,000 of which dealers sold $38,000,000. company $2.000.000. Quotas for 1938, said Mr. Crawford, will be just about the same as those of 1937.

Both Mr. Black, and P. M. Downing, vice-president and general manager, in closing talks emphasized the necessity for maintaining sales programs and efficiency because of increased taxes of $3,000,000 wage increases, shorter working hours and indifferent business conditions. Mr. Black announced a $20,000.000 construction budget for 1938. Likening sales forces to football teams who are heroes when successful, Mr. Downing cautioned his sales forces not to rest on their glory.

Sales Shorts

Southern California electric appliance dealers to attend special educational classes.

Series of educational classes for managers and proprietors of electric appliance stores in southern California will begin early this month. The program will be carried on by the domestic appliance committee of the Electrical Development League with the cooperation of the State Department of Education.

Instructors for the classes, strictly limited to dealers and not intended to include dealers' salesmen, were chosen last month from a group of leading men specially trained by Professors David Jackey and Willis M. Kenealy, supervisors of trade and industrial teacher training for the department of education.

Under the proposed plan, six meetings will be held once a week or once every other week. If feasible, luncheons will be held between conferences, at which time leaders may discuss the work accomplished and submit material for the development of standard practice.

●

More Light for Displays

Well lighted window displays form one of the principal keys to retail merchandising success, W. E. Potter, promotion director of the General Electric Co. in Pacific Coast states, told a recent meeting of the retail merchants bureau of the Vancouver, B. C., Board of Trade.

Since the average person walks by a store window display in three seconds, Mr. Potter said, such displays should be simply designed but carry a central dominant theme. Illumination necessary to effective displays is 100 ft. candles. Contrast obtained through use of additional footlights and spotlights is also essential.

●

Customers' Service

The traditional, over-the-counter method of dealing with customers has been wiped out by the Washington Water Power Co. at Spokane and a group of trained contact men, stationed at desks in the lobby of the general office building, substituted in its place.

The new set-up is embodied in a Customers' Service Department, which handles all customers' service matters. James Winton is in charge.

Operating in close liaison with meter, repair and credit departments, the new unit is organized to serve customers with minimum delay and maximum convenience. Customers desiring to open or close accounts, to obtain duplicate bills or wishing to discuss any phase of their accounts are received by one of the trained contact men at a desk. These men are in communication by telephone and dictograph with file clerks in an upstairs office, where all customers' records are maintained.

●

Pink Tag Sale on '37 Models

To clear the way for new 1938 models, 250 Los Angeles electric appliance dealers are this month offering a Pink Tag Sale with drastically reduced prices on all 1937 models and demonstrators. Anticipated is movement of all present stock by Feb. 1.

Large advertising campaign through newspapers, letters, window displays and personal selling efforts are emphasizing the slogan "See the Pink Tag Clearance Sale Specials at Your Dealers Now." Other play-up angles include low down payment, five years to pay on EHFA terms.

●

Al Joy, R. E. Fisher, P. M. Downing at P. G. & E. meeting

THREE MORE FIRMS last month signed contracts with the Golden Gate International Exposition for exhibits in the Hall of Electricity. They are General Cable Co., displaying a full line of underground and overhead cables for distribution and transmission; Gordon E. Wilkins Co., showing how its domestic electric ironing equipment takes the drudgery out of home laundry work, and Bowie Switch Co., displaying a motor-operated air-break.

●

FIX-IT TRUCK operated by Utah Power & Light Co.'s Provo division made 3.200 calls in thirteen weeks. Cost per dollar e.a.r. for the truck was comparable to other sales activities in the division. One repair was made in every four calls.

To Answer Customer Queries

Nine specially trained employees of the Northwestern Electric Co. will call upon each residential customer during the next few months to answer questions concerning the service. give suggestions on the use of electrical appliances and carry back to the company suggestions which may improve the service.

According to the plan worked out by J. C. Plankinton, manager of the sales bureau, each employee will take to the customer's home a statement of the customer's cost of service for the past year. This statement can be broken down to cover the various electrical appliances in use.

●

TO HELP COMMERCIAL CUSTOMERS get "every last penny's worth" out of the service, Washington Water Power Co. has sent out small, gum-tipped posters warning: "Keep your lights clean—good lighting will help increase your business; one month's collection of dust on a clean light will waste 20c of your lighting dollar. Wash all lamps and shades once a month." Printed on the posters, which are supposed to be pasted up in a prominent place, is a table giving the names of the months and leaving space for customers to note down when the lights were cleaned. No effort is made to sell anything.

●

SPECIAL DOLLAR LIGHTING RATE for the Christmas season was repeated by the British Columbia Electric Railway Co. this year. A flat rate of a dollar to cover twenty-five 25-watt lamps to be burned on outdoor Christmas trees between Dec. 15 and the end of the month was made through the members of the Vancouver Electrical Assn. This materially aided contractors in promoting this type of outdoor decoration during the season. A special contest among the members of the electrical industry was also announced with a first prize of $10 in electrical merchandise for the best decorated home.

●

IDAHO POWER CO.'s twelfth annual Mazda-ho campaign ended with 146 per cent of quota attained. Number of bulbs sold was 92.365; watts, 7.289,-483. Pocatello division led all others.

●

TO MEET THE CHRISTMAS DEMAND, General Electric Co. shipped two trainloads of electrical appliances to northern California. The shipment is believed to have been the largest of its kind ever made to this territory.

●

NEW HIGH was set in Southern Colorado Power Co.'s 1937 Fall Lamp Campaign. Lamps sold totaled 41,301; wattage, 2,806,304.

Thanks to Sales Guide Advisors

Practical and simple ideas come from those actually engaged in a job. To such people ELECTRICAL WEST has gone for the practical and easy-to-use ideas in the monthly Appliance Sales Guides. To them ELECTRICAL WEST wants to express its thanks and accord them some measure of recognition due.

First of these anonymous advistors is J. U. Berry, display manager for Valley Electrical Supply Co., Fresno, Mr. Berry is a traveling advisor in window display to the 190 dealers of the San Joaquin Power system. With what materials he finds at hand, plus corrugated board, and a show card paint kit, he takes the dealer's merchandise, creates a display and many a prize winner has he made. His simplified display ideas have been easy to use and essentially practical.

Demonstration ideas, easy to use and quick to arrange, have been contributed by Clyde Allen, Hotpoint distributor; Earl Warren, appliance store manager, San Diego Consolidated Gas & Electric Co.; Jack Hoyt, of Occidental ranges; Kenneth Hampton, store manager, Valley Electrical Supply Co., and Bob Clark, Puget Sound Power & Light, for aid with the Water Systems material, I.E.S. lamps, etc. Thanks, also, to the legion of others consulted, too numerous to mention.

CAFETERIA FUN —by Russell

Once he gets through playing around your rush hour worries will be over

APPLIANCE SALES REPORT

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE

November 1937	L. A. Bureau of P. & Lt.[1]		Idaho Power Co[2]		P. G. & E. Co.[3]		San Diego Cons. G. & E. Corp.[4]		San Joaquin Lt. & P. Corp.[5]		Southern Calif. Edison Co., Ltd.[6]		Utah Power & Lt. Co.[7]		Wash. Water Power Co.[8]	
	Current	11 Mos.	Current	11 Mos.	†Current	11 Mos.	†Current‡	11 Mos.	Current	11 Mos.	Current	11 Mos.	Current	11 Mos.	Current	11 Mos.
Ranges	424	5,829	266	4,305	425	4,057			122	1,565	378	6,344	237	4,410	130	2,068
Water Heaters	145	1,582	116	2,069	259	2,387			73	818	156	2,442	47	1,563	112	1774
Air Heaters, aux.	369	1,696			1,049	6,781			132	442	513	2,895	136	1,275	358	1404
Air Heaters, 220	116	448			237	1,185			79	772						
Refrigerators	1,532	35,585	157	5,437	4,071	47,129			132	5,968	1,761	47,331	216	10,433	255	7,552
Dishwashers	11	111	1	17	29	210			5	40			12	66	10	22
Washers	1,669	19,018	303	3,490	3,674	30,804			344	3,941	2,453	31,835	757	9,806	395	5,707
Ironers	257	3,129	36	411	816	7.363			76	681	366	4.884	59	614	32	535
Vacuum Cleaners	506	6,021	170	1,237	2,736	28,773			96		1,337	12,546	347	5,475	238	2,721
Radios	2,261	24,305	968	6,741	13639	103,105			754	6,185	5,219	50,589	1,710	13,946	1,510	12,095
Mixers	192	1,706	84	718	361	6,243			74	566	609	4,288	114	1,991	139	1,604
Cookers, Casseroles	89	631	16	299					78	1.503	109	1.007	114	1.004	258	3.384
Irons	638	6,036	552	4,750					390	3,739	1,796	16,294	865	12,832	814	8,982
Waffle Irons	344	1,733	184	1,403					138	966	785	5,148	397	4,261	291	2,041
Toasters			213	1,878					175	1,473	992	7,247	420	5,978	537	4,731
Table Stoves	213	1,468	104	1.594					114	1.097	252	2.944	418	9.079	114	2.214
Heating Pads	227	917	108	615					137	1,022	376	2,675	148	2,324	202	1,465
Curling Irons											80	602	85	3,009		
Coffee Makers	92	1,094	257	1,879					152	1,303	358	3,686	344	5,561	675	4,562
Sewing Machines			10	159	905	12.025							107	1.594	57	647
Clocks	299	1,983	97	617					222	1,652	787	6,096	215	4,070	378	2,963
Fans	12	1,439	25	1,476					5	1,831	48	4,326	21	2,237	36	2,389
Floor Polishers																
Sun Lamps	6	172	6	58							29	409	16	124	1	23
Reflector Lamps			636	3,053					198	1,604			1,375	9,904	2,059	10,879
Miscellaneous Lamps			656	4,334					173	1,153			575	9,087	737	7,787
Yard Lights									30	510						
Misc. Small Appl.	266	2,597							122	1,486	682	7.500				

Sources:

[1] Compiled by Los Angeles Bureau of Power and Light for territory served by that system.
[2] Figures compiled by Electric Equipment Sales Association. Include power company sales and sales of all reporting dealers—about 60%.
[3] P. G. & E. reports sales of major appliances only based on accurate reports available from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. Total dealers include gas as well as electric dealers.
[4] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Clocks, fans, included under miscellaneous.
[5] Includes dealer reports from Midland Counties Public Service Corporation also. Compiled by Valley Electrical Supply Company.
[6] Includes reports from dealers on San Joaquin Valley system of company as well as Southern California areas served.
[7] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.
[8] Dealer sales only for Spokane and company territory. Company sales not included. Table stoves, grills included with cookers.
† Under current month heading is shown previous month's figure. Lag of one month is also shown in total sales for year to date, which began December, 1936.
‡ November report was not available at time of going to press.

ELECTRICAL WEST

Appliance Sales Guide

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Kind of Equipment You Can Sell

* Air conditioning
* Air heater—for cashier, office, store
* Bakery stove
Broiler
Coffee maker
Coffee urn heater
* Dish washer
* Dish water heater
* Dumb waiter
* Elevator
Egg boiler
* Fan—circulating
* Fan—exhaust
Food warmer table, made up in any combination of trays and wells, each individually heat controlled
Fry kettle
Griddle
Grill
Hot-plate
Juice extractor
* Lighting
Mixer—for bread
—for cakes
—for drinks
* **Oven**—baking
—roasting
* **Range**
Range top, only
* Refrigeration
Roll warmer
Roaster
* Steam boiler
* Steam table
* Sign for outside
Slicer for cold meats
Toaster
* Water boiler
* Water heater
Waffle baker

* Heavy duty or auxiliary equipment that can be sold in cooperation with manufacturers and utility or by other departments of your store.

Who makes or supplies it—

Lang Manufacturing Co., 2754 1st Ave. So., Seattle, Wash.

Dohrmann Hotel Supply Co., 972 Mission St., San Francisco. (Salesmen in all principal western cities.)

Edison-General Electric Appliance Co., Chicago. (Representatives in all trade divisions in the West.)

Griswold Mfg. Co., 128 Raspberry St., Erie, Pa.

Hamilton Beach Co., Racine, Wis. (or K. W. Hudkins, 6520 Commodore Sloat Dr., Los Angeles.)

Landers, Frary & Clark Co., New Britain, Conn., (or C. J. E. Watson, 718 Mission St. San Francisco.)

McGraw Electric Co., Minneapolis Minn., (or A. J. Cole, 1627 Hi-point St., Los Angeles.)

Silex Co., 86 Pliny St., Hartford, Conn., (distributors in western trade centers.)

Wells Mfg. Co., 220 9th St., San Francisco.

Dealers Will Find Profit Possibilities

in Electric Counter Cooking Equipment

Few dealers have appreciated the special conditions that afford an enterprising salesman a good market in which to sell commercial cooking equipment. Frightened by the size and bulk of heavy duty cooking equipment few dealers have realized that there is a good business to be had in the sale of electric counter cooking equipment. Here is why more dealers should interest themselves in these products:

1. Wherever food is served, counter equipment is needed
2. Each counter appliance has a sales value of from $25 $150. Each sale is worth making.
3. It carries a good profit margin.
4. Each sale leads to other future sales. Satisfaction with electric operation makes the next sale easy.
5. A single customer can buy as much as $500 worth of equipment, and is a good prospect then for refrigeration, air conditioning, ventilation, lighting, and often heavy duty equipment.
6. A dealer can take advantage of utility and manufacturer displays and sell with small inventory.

Sources of Sales Help

and information

Your closest source of information and cost data is your local utility. It maintains a commercial cooking staff that keeps on hand the pertinent and important selling material you will find invaluable in answering questions as to cost and service.

●

Available through the utility is the "conference report of the Third Annual Commercial Cooking Conference" of the Northwest Electric Light and Power Assn. You will find it filled with cost and operating data, ideas for selling, exchange of experience that will show you short-cuts to selling.

●

Advertising broadsides and helps that fit your particular type of selling are available from the Commercial Electric Cooking Council, sponsored by the Edison Electric Institute and National Electric Manufacturers Assn.—420 Lexington Ave., New York City. Sets of 2 folders are offered at $7.50 per 100 sets; imprints $2 extra.

●

Take advantage of traveling displays, local exhibitions for restaurant men, manufacturer's exhibits. Some of the catalogs available are a gold mine of ideas.

January 1938

Commercial Cookery

. . . When the

Your sales presentation

will be more effective if it contains these ideas—

"Mr. Prospect, if the desire to modernize and improve the appearance of your place were the only influences in favor of using this electrical equipment, I would not suggest it, but you know better than I do that there is a great deal more to operating this business of yours at a profit than appears to the naked eye. What you want is equipment that offers you distinct advantages in these important ways:

1. **Long time economy** that comes from reduced food spoilage, because temperatures for cooking and keeping foods are absolutely and automatically under your control.

2. **A better tasting** and hence a better selling product, because the process of cooking can be duplicated every time under identical conditions of temperature and time.

3. **More real value** from your fuel dollar because with electric equipment every bit of energy is efficiently applied to the job it is meant to do, and less is wasted in heating up the surroundings.

4. **Cleaner and pleasanter** operating conditions that will tend to reduce labor turnover and help you get and maintain the best results from your employes.

5. **Fire and explosion hazard,** always on your mind where fats and oils are heated, will be materially reduced. This will mean greater peace of mind to you, probably a better insurance classification.

6. **Your floor space** can be utilized more productively, for this equipment takes less space, and is more easily moved for rearrangement.

7. If it is more convenient to serve from one unit located in some other part of the kitchen or elsewhere, this neat looking, easily kept clean and attractive electric equipment can be **used just where it will be handiest.**

8. **Longer life and less maintenance,** because the controlled way in which heat is applied electrically gives the maximum life to the equipment. It also means that utensils have a longer and more useful life too.

9. **Shrinkage savings to you,** because the food will shrink less, require less trimming and discard, keep in better condition.

10. **Savings in the cost of redecoration** and painting, because the entire place can be kept cleaner.

11. **A cooler kitchen** which means less heat to remove when you later install air conditioning. It costs seven times as much to **remove** heat as to produce it.

12. **More attractive** to your customers because the flavor and taste of your food will be uniformly better, the place will be more attractive and inviting, and you can count on more repeat business. There is an advertising value to clean electric equipment.

Then if the Prospect says "No"

First, be patient and considerate. Then, if the prospect has not indicated why he turns you down, try to get an expression from him by questions as to just what his objections or resistances are. You will find that they come under one or more of the following:

1. **Equipment costs seem too high.**
2. **He fears operating costs will be high.**
3. **Cost of wiring may appear high.**
4. **Imagines that maintenance is high.**
5. **Has a prejudice that electricity is slow.**
6. **Afraid to try something new.**
7. **Fears his help will not be able to operate.**
8. **Plans to move soon.**

Each of these objections may be stated in somewhat different form, but essentially they will be found to contain such thoughts or fears. In answering each of these objections the salesman who knows his merchandise, knows approximate costs, and comparative costs, is best equipped to make the sale in spite of the resistance. A diplomatic way to introduce your facts and figures in meeting each of these obstacles (in numerical order) will be found on the facing page. Suggestions as to sources of material to be used in more complete answers to each of these questions will be found on the first and last page of this Sales Guide.

Prospect Says: "NO"

NO. 1B

COMMERCIAL COOKERY

In your Answer—

use these Tested, Action-producing ideas:

1. While the initial cost of equipment is higher, it is the overall economy, the long time thrift that will mean money to to you because of food savings, longer life, less maintenance, less labor turnover and better working conditions. And if the cleanliness and improved taste bring you more customers, that is more important than out-dated equipment that offers fewer operating savings, isn't it? Here are some actual figures on this subject, comparing the **complete** costs . . . . (Here the salesman introduces data which the manufacturers or his utility will supply).

2. Operating costs high? Perhaps so if by that you mean only the cost of fuel. Yet it is the overall economy that counts with you, isn't it—the stopping of a number of small leaks in your operating costs because electric equipment makes more efficient use of its heat. It is easier on your utensils, saves on soaps and scouring materials, saves on shrinkage of the food and the waste trim, because it cooks so much more carefully and under such fine control. These items do not appear on your fuel bill, but they are real costs, nevertheless. Suppose we analyze your own costs here with this equipment in just this way—

3. Yes, installation cost is something to be considered. But once you make this investment, think how much easier it is going to be to change your equipment around with electricity than it would be where the equipment has to stay put near piping, flues, and drains. There is a further value in electrical counter equipment in that it will take less attention and maintenance than any other, once it is in. The convenience of it—just plug it in, or turn the switch when you want it—is a time saver and economy producer that makes it pay for itself many times.

4. Maintenance high? I wonder how that impression could have been given to you, for really quite the opposite is true. You see, the way in which electricity is applied to the work in an electric device is under so much closer control than with flame fuel that the life of the appliance is usually rated longer than the customary 10 years. This makes your original investment work longer for you, and earn more. And in everyday routine cleaning up, this attractive electric equipment is far easier to keep spic and span. Resale value will be higher, too.

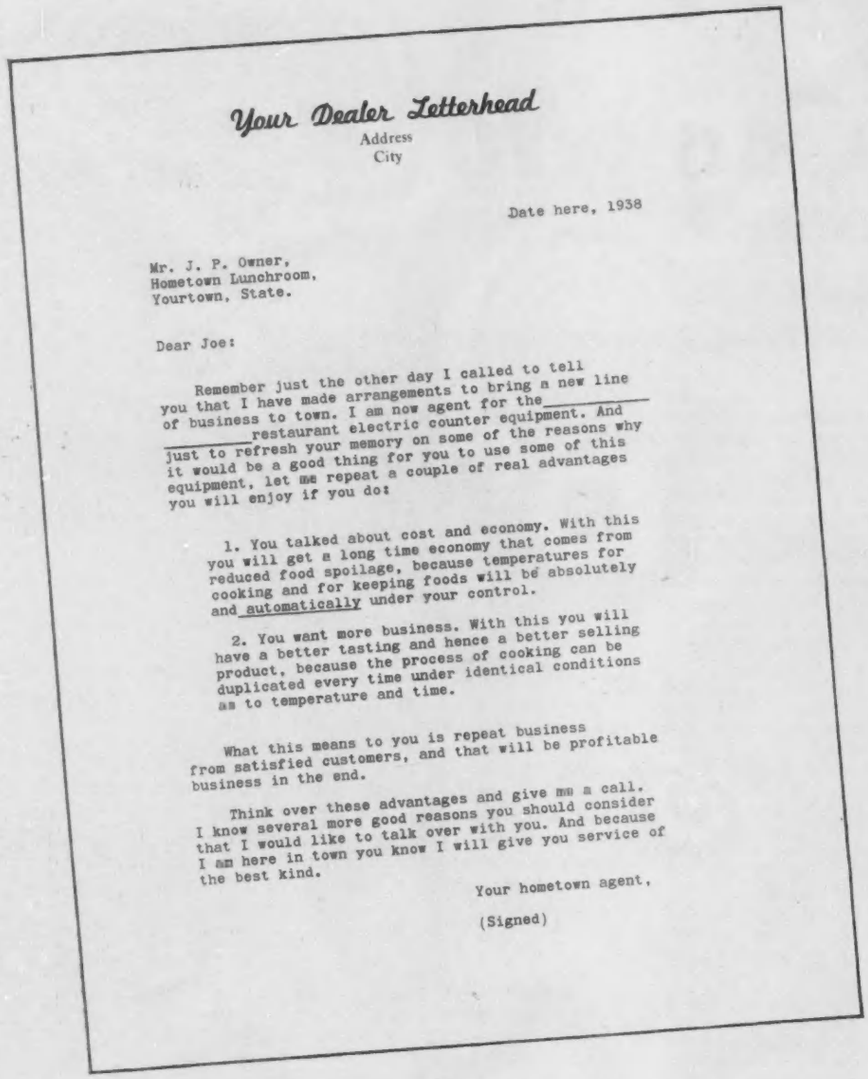
5. Electricity is slow? That used to be true, perhaps, but so were automobiles at the same time in our history. With the new developments and improvements in electrical equipment during the last year or two, electric equipment is now as fast as any. Electricity is so quiet about its work that it is sometimes hard to realize that it is working at all, but timed tests against other fuels show it to be as fast as any; and what is more, under accurate and automatic control.

6. I can understand that it would seem strange for a little while to operate a new type of equipment. Yet when the equipment almost operates itself, as this electrical apparatus does, you will find this the easiest to learn to use that you or your employes ever tackled. What is more, you will reduce your percentage of spoilage and waste, because the automatic temperature control requires less attention and never overcooks or burns. A great many of the routine, easy cooking operations can be done by assistants instead of the head cook.

7. The problem of keeping good help is very serious, I know. Yet do you know that electric equipment is often a big factor in keeping them satisfied? After the very short time necessary to become acquainted with the easier way to operate this electric equipment, the improved appearance of the kitchen or work space, the easier cleaning, the reduced chance of spoilage with its aftermath of criticism and argument, the healthier atmosphere, all contribute to better satisfied help and less labor turnover.

8. Planning to move? Fine. You will then have an excellent opportunity to introduce, without the least disturbance, quicker ways to do things and better arrangement of your equipment. You will have a neat, clean, freshly painted place that you will want to keep attractive as long as possible. Suppose I bring you over the data on some of this new equipment and see if I can work out with you a number of time and labor savings that will more than justify discarding some of this old equipment in favor of the more efficient, more modern new electric cooking apparatus.

PACIFIC POWER & LIGHT CO. • IDAHO POWER CO.
UTAH POWER & LIGHT CO. • WASHINGTON WATER POWER CO.



Your Dealer Letterhead
Address
City

Date here, 1938

Mr. J. P. Owner,
Hometown Lunchroom,
Yourtown, State.

Dear Joe:

Remember just the other day I called to tell you that I have made arrangements to bring a new line of business to town. I am now agent for the_____ _____restaurant electric counter equipment. And just to refresh your memory on some of the reasons why it would be a good thing for you to use some of this equipment, let me repeat a couple of real advantages you will enjoy if you do:

1. You talked about cost and economy. With this you will get a long time economy that comes from reduced food spoilage, because temperatures for cooking and for keeping foods will be absolutely and automatically under your control.

2. You want more business. With this you will have a better tasting and hence a better selling product, because the process of cooking can be duplicated every time under identical conditions as to temperature and time.

What this means to you is repeat business from satisfied customers, and that will be profitable business in the end.

Think over these advantages and give me a call. I know several more good reasons you should consider that I would like to talk over with you. And because I am here in town you know I will give you service of the best kind.

Your hometown agent,

(Signed)

To Advertise . .

counter cooking equipment, the dealer will find letters sent individually to his prospects in his trading radius to be most effective and economical. Good personal letters bring the most action and therefore profit.

●

Often dealers dread to write letters. This dread usually springs from an uncertainty as to what to say. If there were something simple to say, they feel, they could "get going."

●

Here is a simple yet effective "self starter". Inside this Sales Guide, on the second page, are a list of 12 universal advantages enjoyed by the user of electric counter cooking equipment. Of course, every kind and type has others made possible by its construction details.

The letter above is an easy-going sample of what can be done as a starter. It is a natural follow-up of a personal call on the prospect to tell him that you now handle the line. With slight changes it could be used to follow up the usual letter of announcement to the prospect.

●

Just the first two of 12 advantages are used in this first letter. That is usually enough for one letter. Too many at first do not allow each advantage to sink in. Only list all 12 in the last letter.

●

The second and subsequent letters can start off easily, "In my letter last week I told you of two very fine advantages you would have if you were using electric counter cooking equipment *(to name some specific appliance is better—the one that he does not have and needs first)*. Here are two more good reasons why you should be using this equipment—"

Ideas Useful in Making Sales

Learn to "talk the language" of the restaurant man, baker, candy maker, hotel man, and he will buy quicker. To learn the language means to spend some time in the bakery at night, going through the processes. Spend time in the restaurant kitchen watching the way the rush hour is handled. Be observant, for you may be able to think of ways by which use of your electric equipment can cut cost, eliminate confusion, simplify serving, speed preparation, or do something automatically. Such observation may also uncover ventilation, refrigeration, lighting, or other electrical business.

●

Good thing to know is that roughly of the average baker's dollar, approximately 28 per cent represents labor, 17 per cent other expense. Included in the labor cost is that of turnover. Electric equipment balances off its higher fuel cost against better conditions of work and reduced labor turnover.

●

From bus boy to chef, National Cash Register has made a study of restaurant business. The restaurant dollar represents approximately 50 per cent supplies, 25 per cent labor, 16 per cent expense, and 9 per cent for investment.

●

Talk in terms of cents saved, even fractions of a cent, rather than percentages. For instance: A restaurant serving 18,000 meals per month can save in shrinkage of meats, fish, and poultry in one month by using electricity for cooking from 8 to 12 per cent. Translate this into cash. At 30 cents per pound the actual minimum saving should be $144 per month.

●

Pots and pans come in for fractions of a cent saving. They last approximately three times as long cooking electrically. One restaurant saved half the cost of its soap and washing powder, as well as $2.50 a month for steel wool used in cleaning pots and pans. This is the kind of information that you can obtain by close contact with restaurant people.

●

Modern trend in large hotels is away from the all-purpose, heavy duty equipment, towards smaller specialty equipment with cooks or helpers assigned each to his specialty. Urge this trend. It means more electric equipment because of its automatic control features.

●

Candy kitchens are a growing market for electric equipment. Candy makers worship cleanliness. They need equipment that offers positive heat control. Air conditioning will aid them too.

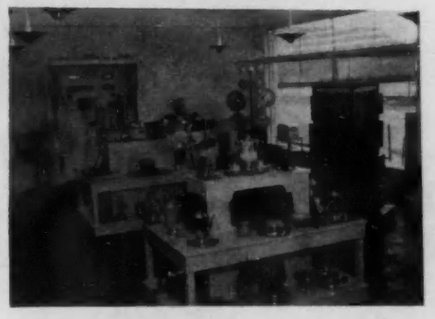
●

Schools, colleges, hospitals, institutions, offer a good market for this equipment for cafeterias, lunchrooms, diet kitchens, etc.

●

Not a bad idea to borrow the trade magazines of bakers and restaurants to learn more of their "language."

Hollywood Wholesale's New Home Is Handy



Sales room provides attractive display of appliances, chimes, switches and lighting units. Service counter (top) behind which steel shelves hold counter stock. Access to the warehouse is handy at the right

Cable reels are mounted on a rack that permits pay-out of wire for easy measurement. Pipe elbows are in a handy rack. Bx coils are stacked at rear. Quick assembly of contractors' orders is the rule

Steel pipe welded rack, self supporting, stacks great volume of conduit without strain on walls. Trucks can drive in between these racks and stock shelves in warehouse (below) to load supplies

Adequate Home Wiring Due To Make Long Strides in '38

If the balance of the electrical industry follows in the steps the utilities already have taken, adequate home wiring in California in 1938 will take long strides forward. Four things contribute to this picture:

1. The Red Seal standards have been increased so that they now require more convenience outlets and a water heater circuit in addition to the previously required range circuit.

2. A modified Red Seal plan has been set up to make available inspection and certification to homes heretofore denied these services. Under this plan a modified certificate will be issued to homes which comply with all Red Seal requirements except for those concerning the range and water heater circuit. Proviso is made, however, that the installation include space at the main switch or distribution panel for future installation of range and water heater switches and stubbed conduit from the switch location to some accessible point from which it may be continued.

3. All California utilities have accepted the new plan and agreed to promote it instead of any individual wiring plans. Southern California Edison Co. is converting all its former heating specialists into Red Seal specialists; San Joaquin Light & Power Corp. and Pacific Gas and Electric Co. are writing Red Seal promotion into their 1938 sales plans.

4. The Electrical Development League of southern California has accepted the Red Seal plan for promotion and the Los Angeles Bureau of Power & Light has agreed to handle the inspection service in its territory.

●

Device to Test Home Lighting Introduced

A simple yet ingenious little indicator as to the effectiveness of home lighting has been designed by Charles Grunsky, electrical engineer, Coast Counties Gas & Electric Co. and is being used by the lighting staff. Called "Sightseer," it consists of a ruler-like fold of heavy paper, 5 in. long, at the end of which is a circular disk of celluloid. In the disk are carved a circle, a diamond and a star. One portion of the disk is painted an opaque color. Back of the disk is run a piece of sensitive photographic paper which turns dark upon exposure. Twenty or more tests can be made with the length of tape in the holder. The Sightseer is designed to measure lamplight, not daylight. It is placed face up on a book or other working surface so that the light fall-on it will be the same as that available for the particular eye task involved. The disk is revolved until a character, either diamond or star, centers in the holder over the sensitive tape. A table of time exposures is given. For instance, exposure of 60 sec. is required on an eye task such as homework, sewing or reading; 30 sec. for critical or fairly prolonged visual tasks and 20 sec. for kitchen work, children's games, card games, etc. After such exposure the disk is revolved to the circle and if the light is sufficient the diamond or star will be directly visible dark against the white background.

●

Seattle City Light Wins Test on Globe Purchases

Reversing a King County (Wash.) Superior Court decision, the State Supreme Court recently ruled that Seattle City Light is free to purchase any type of electric light globes it wants for use in the municipal lighting system and for resale to the public.

Action was originally brought by A. Claire Smith, Seattle manufacturer's agent, when the city board of public works advertised for bids on $50,000 worth of lamps of a specified type. Smith, who sold another type lamp, sued to require the board to accept his bid, the lowest submitted.

●

Daylight Control Devices To Be Studied at Palo Alto

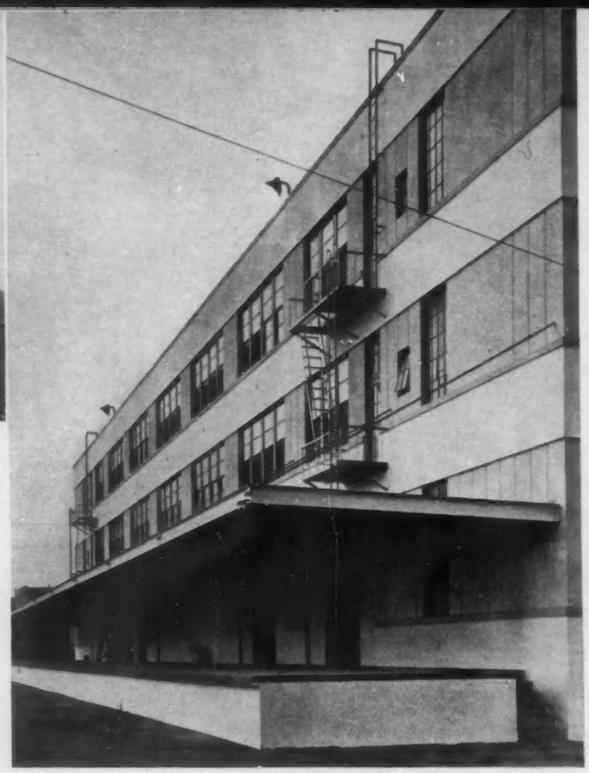
California's campaign for saving sight received a recent boost when Clark Baker, executive secretary, Sight Conservation Council of Northern California, told the California School Trustees Assn. that the State Department of Education, Division of Schoolhouse Planning, has formed a research committee and is assembling equipment at David Starr Jordan Junior High School, Palo Alto, for a study to determine the effectiveness and best methods of handling daylight control devices. Announcement was also made that another course on sight conservation is to be given at the University of California's 1938 summer session under Dr. Phelan of the National Society for the Prevention of Blindness.

●

SODIUM VAPOR LIGHTING bids for the Stockton St. tunnel in San Francisco have been called by the San Francisco Board of Public Utilities. The old tunnel has been illuminated by incandescent lamps for a great number of years.

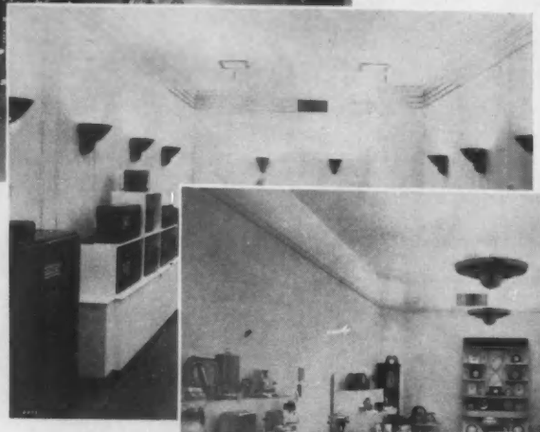
●

G. E. HOME LIGHTING DISPLAY, sponsored by the Snohomish, Wash., District Federation of Women's Clubs, was held at Everett, Wash., by the home service department of the Puget Sound Power & Light Co.



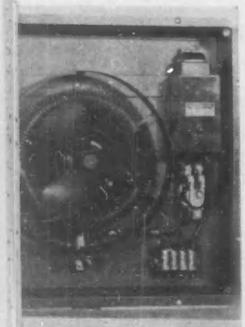
1,189 Kw.

In G. E.'s New Home At Los Angeles

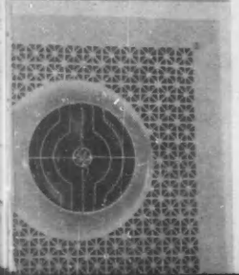


(Top left) Front of building and main entrance to General Electric Co. are to the right; at center is the entrance to G. E. Supply Corp. (Top right) Loading platform at rear of building connects with main-floor warehouse space. It has an area of 5,500 sq. ft., faces a flood-lighted yard, has spur-track facilities at far end, is cantilever roofed for unencumbered shelter

Sam Gates, General Electric's Los Angeles manager. In his office, four ceiling-suspended indirect lighting units with silver-bowled lamps produce 75 ft.-candles on the desk. An enterprising reporter put a lightmeter under his chair. It read 15 ft.-candles



(At left) Developed especially for the L. A. building was this G. E. electric heater. Rated 4 kw., it is mounted near the ceiling, in the wall. Top shows grill removed; lower, grill in place



(At right, top to bottom) 1—Assembly room for conferences, dealer meetings, etc.; on the far wall are the heating units and air duct. 2—Supply Corp.'s store; goods are displayed on column panels and in illuminated glass cases beneath the steel counters. 3-4—Two of the rooms for displaying individual types of equipment and appliances—(3) radios, (4) small appliances. 5—Heavy appliance display hall—at the far end is the complete kitchen display. Comparison of the five rooms indicates the variety of illuminating methods employed. Each, in addition to its main business of effectively lighting the room, constitutes a display in itself

Each Room in Building Constitutes a Sales Display

OPEN house, greeting a host of friends, showing them through a gift-laden home, luring them to your table for a snack—all tokens of the holiday season, began a month early for members of the General Electric Co. at Los Angeles.

But when 1938 rolled around, members of the G. E. did not have to cope with that dog-eared look which a home takes on when the guests have departed. For they face the new year comfortably and efficiently installed in their outstanding, new building. This was the occasion for their well-justified, preholiday celebration which attracted thousands of visitors, many from 500 miles away.

Housing G. E.'s Apparatus Division, Appliance and Merchandise Division, Contracts Corp., and Supply Corp., the three-story structure at Turner and Vignes Sts. is truly a landmark to the company and industry.

You had a premonition of this when you first walked up the steps on opening day. But as your employee-guide conducted you through the place, what you saw and what he told you, plus his contagious pride, built up your conviction that here was a most extraordinary plant.

First your guide rattled off a fistfull of cold facts out of which these hit you hard: connected load 1,189 kw., 480 for lighting, 589 for heating, 120 for power.

And these gave you the picture: ground dimensions, 215x160 ft.; first floor designed for 250-lb. per sq. ft. loading, a section for 600, and other floors for 150; some 817 tons of steel used to reinforce its concrete construction; loads served by 258,000 ft. of wire, through 101,000 ft. of conduit, 7,200 ft. of under-floor duct. Wiring was by R. R. Jones Electrical Co.

First you were guided to the Supply Corporation's store. Here you saw glassed-in show cases beneath steel counters, and equipment displayed on panels fixed to the building columns. Behind the counters you saw steel bins with Holophane units concentrating light upon the stacks, also a special section devoted to broken-package lots, with an electric escalator connecting to the basement storeroom.

In quick succession you saw the other ground-floor facilities, including merchandise service and repair departments, warehouse, including receiving and shipping departments, loading platform, spur truck facilities, spray room for refinishing refrigerators etc., and returned goods room.

In the basement you noted a dozen space-saving schemes for storing heavy equipment, but as an electrical man you were more interested in the switchboard and brace of transformers for serving the building's loads. The latter a bank of three 100-kw., and one of three 200's.

On the second floor you saw the Supply Corporation's operating and clerical departments, and in the sales room were conducted through a series of separate rooms in each of which was displayed a separate class of equipment: transmission material, advertising material, lighting, small appliances, radios. Then too there was a hall, filled with heavy appliances, a model electric kitchen being displayed at one end.

More warehouse space and offices of G. E. proper were on the third floor.

But everywhere, both in the building, and in its equipment, you saw a kind of perpetual display of modern electrical practice. In lighting for instance, you got, as you passed from room to room, a new conception of the art. Intensities were 30 ft.-candles in offices, 9 in warehouse space. And in each room you saw a different type of fixture, appropriately employed.

The heating job, too, opened your eyes. In most of the building were "in-the-wall" forced-convection electric heaters developed especially for this job. Some 100 units, mostly 4-kw. Mounted 8 ft. from the floor, these take advantage of the heat from the heavy lighting load by delivering (each) 200 cu. ft. per min. of air at a velocity of 750 ft. per min. Quiet, thermostatically controlled, they derive heat from a finned-calrod unit, mounted behind a fan, and they maintain room temperature with but a 1-deg. difference between ceiling and floor.

These units alone, you estimated, released 400 sq. ft. of floor space otherwise needed for a heat unit. In a few rooms were ceiling-mounted units, like the foregoing, but cased in a steel housing and rated 7.5 kw. Supplementing both were 11 banks of finned-calrod units mounted in the fresh air ducts.

Your tour ended in the third-floor assembly room, where you soon found yourself, along with a few hundred other guests, going after the sandwiches in a big but polite way. Even with a sandwich in your hand, however, you couldn't resist going in the next room to see the electric kitchen working. Nor could you overlook the desirability of the assembly room as a place for dealer meetings, equipped as it was with accordion doors to separate it into three smaller rooms, and with a portable stage for what have you.

But as you walked away, with several glances over the shoulder, you began to realize it was not the individual things, spectacular as they were, that made this job important, but the organization of the whole—equipment and arrangement for the smooth flow of goods; control of environment for the best work of individuals. A model unit for distribution. A symbol of what electricity can do.

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San Francisco I.E.S. Section Sets Rules, Names Committees

Now a section rather than a chapter, the San Francisco Bay Cities Section of the Illuminating Engineering Society has organized itself to meet the requirements set forth by the I.E.S. First of all, the regular meeting time has been set for the second Friday of each month. Another innovation is the decision that programs be approved by the Board of Managers and must therefore be arranged far in advance.

Leland H. Brown of Stanford University illumination laboratory, chairman of the Section, has appointed the following committee chairmen: Robert L. Dearborn, residential lighting; Leo G. Gianini, light in architecture and decoration; Karl M. Koch, street and highway lighting; Leonard A. Hobbs, school lighting; Prof. Llewellyn Boelter, motor vehicle lighting; Elmer E. Burk, commercial and industrial lighting; Hurford Sharon, new developments, and Roy Myers, meetings and program.

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NATIONAL BETTER LIGHT BETTER SIGHT BUREAU of New York has released a new sound slide film, available for presentation to school children, on eyesight conservation and light for seeing. The film, fifteen minutes in length, is built around famous juvenile movie stars.

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CONTRIBUTING TO THE CAUSE of adequate wiring, *McCall's Magazine* carried an article in its January issue entitled "Money in the Sockets." The piece, directing attention to the thrift resulting from adequate wiring, was written by Kathleen Robertson of the magazine's staff and approved by Earl Whitehorne, editor of *Electrical Contracting*.

To celebrate the manufacture of its two millionth CS meter socket, Westinghouse Electric & Manufacturing Co. prepared a special socket, packed it in a standard carton, "lost" it and offered a $50 reward for its return. That was in December, 1936. Nearly a year later, after many counterfeit sockets had been submitted, Jack E. Sederholm, employee in the Seattle warehouse of the Puget Sound Power & Light Co., found the genuine socket. He is shown above displaying the unit

Industrial Plant Lighting Used in Edison Building

New Southern California Edison Co. building boasting a lighting installation frequently employed in industrial plants but never before attempted in a southern California office building was formally opened at 1324 Fifth St., Santa Monica, last month.

The installation, made in the front office of the two and a half story building housing offices, displays and an all-electric kitchen, gives light which closely resembles daylight. Nine ceiling units, using high intensity mercury vapor lamps as well as the usual incandescent globes, provide 30 ft. candles of light.

Other lighting installations, though nonetheless spectacular, are more commonplace. Indirect lighting fixtures, employed throughout the rest of the building, provide from 25 to 50 ft. candles of illumination and also serve as displays of the various types of office lighting units available. Two Edison signs on the front of the building employ metal letters outlined in neon. The vertical sign is readable from two directions, letters on each side being silhouetted against opal glass panels. The horizontal sign is placed against the wall of the building.

Other structural highlights include a pneumatic tube system to facilitate office routine between floors and an automatic electric ventilating and heating system which cleans and filters outside air before it is distributed through the building.

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Luminescent Billboards Attract Nation's Attention

Luminescent billboards, a product of research started in Berkeley, Calif., by two amateur magicians, Robert Switzer and his brother, have made their appearance in Cleveland, Ohio. Continental Lithograph Corp., has just announced a Division of Luminescence making use of luminescent lithographed posters and printing ink. It also is offering to the trade and public a perfected luminescent paint medium upon which the Switzers have been working since joining their corporation. In an announcement to the art world, the availability of a medium for enlarging the potentialities of oil painting by means of this new luminescent paint medium is described. Descriptive literature is offered by Continental Lithograph Corp. describing the various applications and possibilities of this luminescent material. The luminescent paint may be invisible or partly visible in Mazda or daylight, glowing with brilliance under "Black Light" or ultra-violet where visible rays are screened out.

Ultra-violet light sources which may be used are of the H-3 type X mercury lamps, rated at 85 watts in a T-10 bulb, and with a medium screw base. Operation is on a 115-volt a.c. circuit through a small transformer necessary to stabilize the arc. Visible light is screened out by a theater blue ultra heat-resisting filter.

Best applications of the new medium are on bulletins located in relatively dark places where the surrounding general lighting does not greatly exceed ¾ ft-candle.

Tests on outdoor bulletins exposed to typical summer weathering conditions have proved that no appreciable deterioration of the paint takes places within 60 days. If there should be any flaws, however, the areas may be repainted either with brush or spray gun.

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Highway Accidents Studied by P. G. & E.

Automobile traffic toll of human life has been the subject of much speculation but accurate surveys of actual conditions are still rare. The Pacific Gas and Electric Co., department of public relations and sales, however, has again made a study of the Bay Shore highway, San Mateo Co., for the year 1936.

Tabulations show that 61 per cent of the accidents occur at night; 82 per cent of the deaths occur at night. A part of this road is to be made an experimental highway lighting installation to determine whether the installation of good lighting will cut down the accident ratio.

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NEW STREET LIGHTING CONTRACT providing for decorative fixtures in the down-town district and a maximum addition of 50 lights in the residential district has been signed by the City of Walla Walla, Wash., and Pacific Power & Light Co.

Theater technique is being applied to show windows through the use of spotlights which are left on after the regular window lighting has been turned off. During the hours of major traffic the full window lighting is maintained. Instead of blackening the whole store at nine or ten o'clock, however, a new technique, employed successfully by merchants, has been to train one or two spotlights on a single figure or piece of merchandise. Inexpensive, the spotlight continues to make a center of attraction even after all the other lighting along the street has been turned out. Late passers cannot help but see these displays because of the contrast with surrounding darkness

Toward More "Seeing Ability"

In which is given the factors affecting lighting efficiency and a number of examples to prove the value of clean equipment.

This is the first of three short articles. The others will answer your question: "How should equipment be cleaned? What does it cost?"

By SAMUEL G. HIBBEN
Director of Applied Lighting
Westinghouse Lamp Division
Bloomfield, N. J.

WHEN illumination is purchased, the buyer should rate his purchase on the basis of sustained "seeing ability" per dollar spent. The cost per kw.-hr. for electric power is a prime factor only when we know how efficiently this power is translated into light. The cost of the lamp bulb is a factor only when we know how much and what quality of radiation it emits. The worth of reflectors and accessories is indeterminant until we know just how they redirect and continue to redirect the light to the work. Even so, we must yet reckon with the light that may efficiently come from the lighting unit, but be lost through absorption in surrounding objects or surfaces before it can reach the work under observation.

To a large degree our final criterion, "seeing ability," depends upon the coordinated efficiencies of all such factors. If the efficiency of any one of them is low or is allowed to fall off, then such a weak link weakens the chain and nullifies the good work of the neighboring components.

High cost of low maintenance

Watch the losses through the neglect of the lighting installation, i.e., the high cost of low maintenance. Take council upon how to guard against the insidious losses resulting from such items as low voltage, improper or aged lamps, dusty reflectors, dirty walls and ceiling surfaces, empty sockets—poor housekeeping!

If all our lighting installations and their immediate surroundings could be cleaned and reconditioned today, then the illumination that this nation would receive tonight would be well-nigh twice the amount that it enjoyed last night.

Where maintenance is poor and lighting systems depreciate, the losses due to neglect may be roughly classified as follows:

1. Dirty lamps and accessories.
2. Darkened or discolored walls and ceilings.
3. Lamp bulbs of poor quality or low efficiency.
4. Empty sockets and unobserved burnouts.
5. Aged lamps past their prime of usefulness.
6. Under-voltage burning of lamps.
7. Improper combination of lamp and reflector.

Consider first the advantages and costs of keeping the lighting equipment clean. "Water is cheaper than watts" but in spite of that we would be appalled if we knew how seldom lamps and reflectors are properly washed. Of all our public or private servants, the most conspicuous by their absence are the Gold-Dust Twins — yet washing is vital to our net objective, seeing ability.

For proof—examples

Many commonplace examples exist to demonstrate the importance of removing films of dust and grease from the lighting units. For example, a new Glassteel diffuser in a somewhat smoky machine shop produced over 12 ft.-candles of illumination on the workbench beneath. It had so gradually gotten dirty during weeks of neglect that less than 3 ft.-candles finally resulted, meaning that the cost of light on the work had quadrupled. It meant that out of every dollar spent for electric power and lamp bulbs, 75c were being wasted.

During the investigation of a certain large office building where the lighting units consisted of semi-indirect bowls that appeared from the floor to be perfectly clean, we measured the average room illumination, then removed the glass bowl and washed it thoroughly, replaced it and found that the ft.-candles were increased from 1.8 to 2.4, or 33 per cent.

A third not uncommon example may be taken from a building in Bloomfield, N. J. The totally indirect lighting system after some two years of operation was the subject of dissatisfaction. Some 3.75 ft.-candles were measured on the desk tops.

But with proper maintenance—

First, the reflectors were thoroughly cleaned. The ft.-candles were increased to 4.68 or a gain of 25 per cent. Since the lamp bulbs were visibly aged and dirty, new lamps were installed and the ft.-candles moved up to 5.56, or a gain of 40 per cent. The ceiling was repainted from a yellowish cream to a lighter tint and the ft.-candles grew to 6.78 or a total gain of 81 per cent. Examples of this sort multiply indefinitely.

Of course one must expect a continuous depreciation because of the deposits of dust on reflectors and the aging of lamps. However, this falling off in efficiency is not a straight line function. Usually the greatest losses occur in the first month or six weeks. (Some 15 per cent in the first month is perhaps a fair average). Dust deposited upon old dust is not so costly as is the first thin layer. The loss of light from the normal and unavoidable depreciation of the lamp bulb itself from internal blackening seldom brings the final output of that lamp below 90 per cent of its initial efficiency. However, blackening does continue as almost a straight-line slope; hence a very old lamp bulb can economically be removed and replaced by a new one should it be found to live much beyond its rated life.

EDITORIAL

Another Year—1938

ANOTHER year—1938! What to say about it? How penetrate the mists of present events and read intelligently their meaning tomorrow? Editors tread dangerously as prophets, especially in a field whose every step is predicated on detailed, meticulous fact. There are too many realists, too many engineers who check the mathematics of each step leading to the resultant projection, to risk forecasts anchored only to the clouds of wishes. The electrical industry's dreams that have come true have had more solid foundations than that.

But if it is not unreasonable to project from knowns reasonably far into the unknown, following the general trend lines of past performance, then it is not unreasonable to anchor our hopes for 1938 upon the one vital driving force whose energies have given this industry its purpose and its achievement—the stamina of its human beings, the men and women who implement this industry.

No Napoleon ever looked over so able and experienced an army of stalwarts as this industry has developed and trained. Its sinews have been hardened by adversity, its wits sharpened by the difficulties it has had to face and surmount. Be the campaign in front of us easy or tough, this industry's men and women can be counted upon to give it their best. Upon such a prediction, there is no risk of failure.

Peace may come politically, or the industry may continue to be ridden for witchcraft as it has been, business in general may swing back into stride again after a breathing spell of its own, the international warfares may burn themselves out without setting fire to the whole world,—or they may not. But whatever tomorrow and day after tomorrow may hold out or hold back, the electrical industry will be aggressive and determined to earn its share of the work and reward. That can be counted upon, definitely.

To the men and women who compose the vital living part of that industry, Electrical West makes its salute for 1938. There is no doubt or fear as to the future of that group of earnest people. Its destiny is forward. Its past is substantial and firm —adequate support to carry its weight as it climbs still upward.

Start Educating at Home

BECAUSE business has had its weaknesses distorted by the political spotlight, there is a growing hue and cry for "business to tell its story to the people." This pressure to put its case up to the public has been applied particularly to the utility industry. Many are the Moses' who believe that they have an especially efficacious brand of mass hypnotism which can be used to perform a public relations miracle. Facts show that there is no such miraculous cure.

Educating the public, and we use the word "educating" advisedly, is a more basic thing than merely trying to make people think what we want them to think. In a recent address before the American Management Association Edgar Kobak, vice-president of Lord & Thomas, stated that the problem involves three fundamentals: product relations, private relations and public relations. "Public relations," he said, "really begin at home —in getting the product right; in satisfying the employee that policies are right; and then in realizing that each employee is an outpost of the company."

The place to begin educating is at home—with every member of the industry. Before undertaking to go before the people the story of the electrical industry should be told to every employee. If everyone concerned with the industry knew that management was consistent, enlightened, technically expert; that electricity was a sound value at the price quoted, and that this price included a fair return to labor and to the investor then the people of the industry would develop a pride in it and a zeal for service that might even preclude the necessity of educating the public. It is conceivable that those in the industry would know the story so well and would handle themselves so well, that the public would accept the industry at its real value.

It is a certainty that the public will have confidence in a business, if it has confidence in that business' products, policies and people.

Orchid for A. T. and T.

IN the matter of creating public confidence in the institution and its people, the American Telephone and Telegraph Company has few peers. Latest of its contributions toward recreating public confidence in the essential fairness and honesty of the American business structure is an advertisement which appeared in many national magazines during December.

This advertisement, headed "Up from the Ranks," depicts the presidents of all the 18 Bell companies, tells how and when they started in the telephone business. Here are a group of men with an average of 34 years of service and experience

who literally climbed every rung in the ladder. Starting as operators, clerks, stenographers and linemen, they came up from the ranks to positions as chief executives of one of the largest corporations in American business.

Readers everywhere cannot help but react favorably to advertising such as this. Here is a public reminder that American business is sound, and that the doors are still open to the individual with courage, imagination and determination to succeed.

To G-E—Thanks

MILLIONS of American homemakers have a new conception of the electrical standard of living as a result of the nationwide contest sponsored by G-E and the utilities. With the award of three instead of two New American Homes there was concluded a promotional drive the effects of which will redound to the benefit of the industry in every section of the country. If the story of the convenience, economy, comfort and luxury of the electrical way of living was told to enough people it is questionable if the industry would be able to meet the demand which would be created. G-E's contest is a step in this direction and the industry salutes its unselfish contribution.

Why Not Appliance Servicing?

SOME proof that the world today is growing soft is offered by the service institutions which have sprung up in the last decade. For the most part brain-children of college graduates who were unable to find regular employment, these services are of all varieties and shapes.

Washing babies' diapers, for example was a necessary and accepted household duty until "dydee" washes came into existence. No one worried or bothered particularly about feeding the dog until canine caterers popped up from nowhere with their balanced rations delivered daily.

A similar service which might be offered by some smart young electrical engineers—or by already established dealers—is that of regularly inspecting and servicing domestic electric appliances. For a fixed charge, possibly $5 a year, a man might inspect the electrical appliances and equipment in a home every three months and make such adjustments or repairs as were required. If the vacuum cleaner was out of order, he'd repair it; if a lamp cord was frayed and dangerous, he'd replace it; if the radio needed new tubes, he'd install them. The only additional charge would be for materials used.

Ideal location for such a venture would be a city of about 25,000 population. In such a community a large enough list of customers willing to insure successful operation of their appliances ought to be available.

ELECTRICAL WEST

DEVOTED TO THE ECONOMIC PRODUCTION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER AND ITS APPLICATION TO INDUSTRY, COMMERCE, AGRICULTURE AND HOME IN THE PACIFIC EMPIRE, AND TO THE MARKETING OF EQUIPMENT AND APPLIANCES AND OTHER UTILIZATION DEVICES IN THAT AREA

To make the undertaking even more profitable, it might be possible to equip a trailer with small appliances and lamps which could be sold to the customers.

Appliance servicing is a knotty problem to both dealers and utilities. Some such operation as the one outlined might offer one method of handling it.

Boys' Cooking Points to Sales

FUTURE homemakers in the vicinity of Yakima, Washington, will have little difficulty in convincing their husbands of the desirability of electrial appliances. If the industry can but convince school departments to follow the innovation of food classes for boys such as have been instituted in the newly equipped electrical kitchen laboratories of the Yakima High School, then the appliance salesmen of the next generation would have easy selling.

Here in the words of the home economics instructor is what the course attempts to do:

The findings of a questionnaire given to boys indicate that the occasions on which a boy needs to cook are: when he is out camping or on a hike; when his mother is sick; when his parents or his mother is away, or when, because of a job away from home or some other circumstances, his meals do not coincide with the meal times of the family. The mothers of some of the boys work outside the home and that leaves the boy with considerable responsibility for meal preparation. Breakfast is the meal most frequently mentioned as the one they find it necessary to prepare. Naturally the cooking given them is based on their needs in the situation just mentioned.

The boys are taught to prepare fruits, both fresh and dried, to cook cereals properly and to prepare a good cup of cocoa, tea or coffee. They learn to cook eggs in varoius ways and to cook them properly; to make muffins and biscuits; to make cream soups and chowders; to cook vegetables so that they are appetizing; to fix dishes such as macaroni and cheese, noodles and dried beans; to cook meats well in simple ways, and to make simple desserts such as custards, cornstarch puddings and a simple cake. They are given no fancy cookery, but they have sufficient knowledge that if they are interested they can work out any recipe they care to.

A lot of electric range salesmen would be better salesmen if they had had such training as this, and a lot of men in the industry would see that their wives were cooking on electric ranges if they had taken such a course.

Contractors Meet

Northern Californians Elect O'Connor President

Meeting at San Mateo for its annual winter convention, the Northern California Electrical Contractors' Assn. last month elected J. D. O'Connor of Lupen & Hawley, Sacramento, president for 1938. He succeeds Frank Boyd.

Kenneth Ryals of Stone-Ryals Electric Co., San Francisco, was named vice-president; William A. Cyr of ELECTRICAL WEST, secretary-treasurer. Nominated to represent District 9, National Electrical Contractors' Assn., on the national labor relations committee set up at the N.E.C.A. convention in Los Angeles was Clyde L. Chamblin.

Constitution and by-laws of the northern California association were revised to conform to the new status brought about by increase in national dues and decreased national membership. As a result of this move, the association may lose its charter as Northern California Chapter; but efforts will be made to retain the chapter charter for those members remaining members of the national association. Associate memberships in the northern association were also abolished and dues raised from 75c to $1 a month.

Principal speaker at the session was A. L. Stone, executive committeeman for District 9, who reminded members that the national association is carrying on a three-point program under which it is, first, developing better inter-industry cooperation through inauguration and promotion of industry movements; second, establishing a fair-trading policy in conjunction with other branches of the industry, and third, offering associations the voluntary code of fair competition which is now operating in a large number of cities.

Urging the northern California members to redouble their association activities, Mr. Stone said, "A national association has value only according to the way in which its members use it. No association is any more or less than its members.

Analysis of labor rates and the charges necessary for labor based on present-day overhead and cost of doing business was made by Louis Douat. He pointed out that because of overhead a contractor paying $1 an hour for labor could charge no less than $1.50 or $1.75. Similarly, for $1.25-an-hour labor the charge must be $2; for $1.37½-an-hour labor the charge must be $2.25. Social Security and taxes, plus jurisdictional disputes, technical objections and other interferences, have been largely responsible for this uncertainty.

Renewing acquaintances after some years absence from the industry, C. N. Van Cleef, now retired and living in Los Angeles, attended the recent contractors' convention. He was an electrical inspector in the City of Chicago for 38 years

Other speakers were: Herbert Evans, Nicholas Electric Co., Hollywood, on the Code of Fair Competition operation in Los Angeles; Walter J. Walsh, attorney, on the operation of an arbitration law in conjunction with the Fair Trade laws of the State of California; Harold L. Gerber, chief inspector, San Francisco, on changes in the 1937 edition of the National Electrical Code; Lloyd Flatland, Globe Electric Works, San Francisco, on the need of a mass production program for rewiring homes.

R. W. Griffin, Crown Electric Co., San Francisco, on the advantages of the Pacific Coast Resale Price Book, which gives the contractor a chance to use selling prices instead of cost, avoid arguments and carry on his business with sufficient margin to pay the added taxes and costs; L. F. Lindstrom, Jr., San Mateo Electrical Contractors' Assn., on the need of clear specifications and a definite policy on the allowance for fixtures; Mr. Cyr on "I Am Your Customer," and Mr. O'Connor.

Hosts to the meeting were Moss Beach, president; Mr. Lindstrom, secretary-treasurer; Seth Cohn, chairman of the arrangements committee, and R. Guy Smith, all of the San Mateo Electrical Contractors' Assn.

Next meeting of the association will be held in Monterey, April 2.

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FOLLOWING THE RECENT AFFILIATION of the Vancouver Electrical Assn. with the Retail Credit Grantors' Assn., at Vancouver, B. C., announcement was made that in the future the credit report service will be extended to V.E.A. members through the credit organization. In the past this service was operated for association members by a private credit report firm.

P. C. E. A. Dates

Conclave Set for Fresno; Convention for S. F.

Two important dates have been set by the directors of the Pacific Coast Electrical Assn: The annual spring conclave will be held in Fresno April 7 and 8 and the annual convention in San Francisco May 26 and 27. Program details for the Fresno conclave will be worked out by section guidance committees and arrangements for the San Francisco convention will be supervised by President R. M. Alvord and Vice-President P. M. Downing. President Alvord has appointed Stanley W. Scarfe of the General Electric Co. general convention chairman.

Following the successful regional PCEA meeting at Sacramento, the board of directors has authorized similar meetings to be held in Riverside, San Diego and Bakersfield for January, with a fourth meeting to be held in Watsonville later.

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Southwestern I.A.E.I. Committees Named

Edward M. McLaughlin, president, Southwestern section, International Association of Electrical Inspectors, Richmond, Calif., has just announced appointment of committees for 1938 activity. They are: articles of association committee, R. H. Manahan; California State safety orders, G. E. Kimball; civil service committee, C. T. Coyle; clearing house committee, C. E. Hardy; code coordinating committee, E. H. Snedaker; investigation of electrical fires and accidents committee, G. E. Kimball; legislative committee, R. W. Wiley; membership committee, A. E. Cohn; ordinances committee, V. H. Hartley; Pacific Coast building conference joint committee, F. H. Vore; publicity and public relations committee, W. A. Cyr.

In addition to these, chairmen of articles committees for each of the articles in the National Electrical Code have been named. A recent letter notifying all members of their appointments has been forwarded and secretary-treasurer Gerber has asked that committee reports and recommendations be cleared through the clearing house committee early next year so that reports can be made at the next convention in Long Beach, September 1938.

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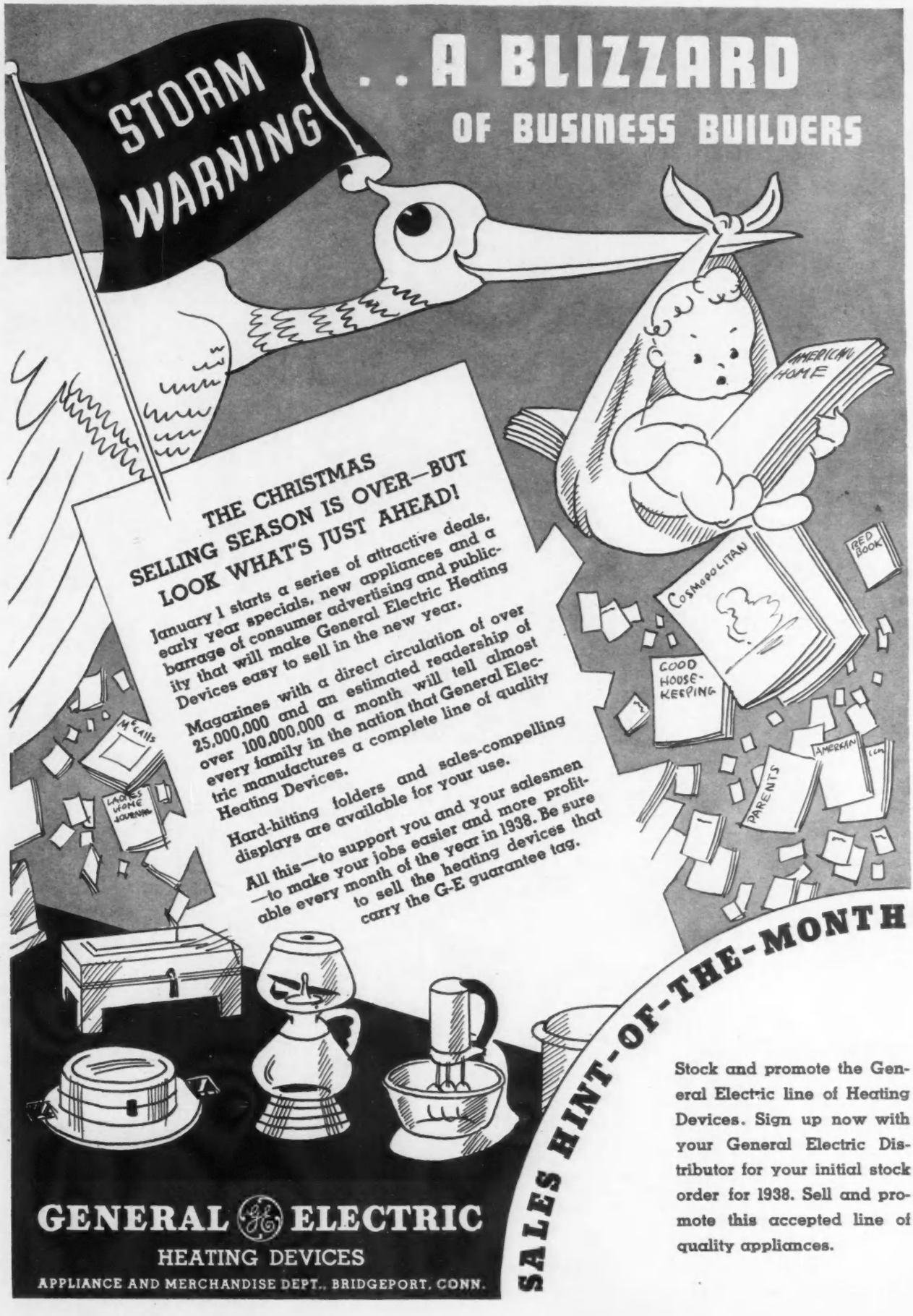
NORTHERN CALIFORNIA CHAPTER of the Southwestern Section, International Association of Electrical Inspectors, plan a meeting Jan. 19. Time and place have not been definitely decided.


STORM WARNING
. . A BLIZZARD
OF BUSINESS BUILDERS
THE CHRISTMAS SELLING SEASON IS OVER—BUT LOOK WHAT'S JUST AHEAD!
January 1 starts a series of attractive deals, early year specials, new appliances and a barrage of consumer advertising and publicity that will make General Electric Heating Devices easy to sell in the new year.
Magazines with a direct circulation of over 25,000,000 and an estimated readership of over 100,000,000 a month will tell almost every family in the nation that General Electric manufactures a complete line of quality Heating Devices.
Hard-hitting folders and sales-compelling displays are available for your use.
All this—to support you and your salesmen —to make your jobs easier and more profitable every month of the year in 1938. Be sure to sell the heating devices that carry the G-E guarantee tag.
AMERICAN HOME
RED BOOK
COSMOPOLITAN
GOOD HOUSE-KEEPING
PARENTS
McCALLS
LADIES HOME JOURNAL
GENERAL ELECTRIC
HEATING DEVICES
APPLIANCE AND MERCHANDISE DEPT., BRIDGEPORT, CONN.
SALES HINT-OF-THE-MONTH
Stock and promote the General Electric line of Heating Devices. Sign up now with your General Electric Distributor for your initial stock order for 1938. Sell and promote this accepted line of quality appliances.

NEWS OF THE INDUSTRY

SUPREME COURT RELEASES PWA FUNDS

In its decision of Jan. 3, the Supreme Court unanimously upheld the right of PWA to loan and grant funds for municipal power projects. This action gave the green light to projects, involving $15,370,909 in the Far West, which had been halted by injunctions.

These are: Imperial Irrigation Dist., City of Redding and, indirectly, Sacramento Municipal Utility Dist., all in Calif., and Las Vegas, Nev.

Second decision, 6-2 leaned by implication toward prudent investment theory, remanded Pacific Gas and Electric's gas-rate case to lower courts for further findings, held that rate-making bodies have leeway in accepting valuation evidence. Thirdly, the court agreed to review Ebasco's case to test parts of the utility holding act.

INCORPORATED UNION WINS P. G. & E. ELECTION

Independent, incorporated California Gas & Electric Employee's Union last month knocked Committee for Industrial Organization aspirations into a cocked hat when it won the collective bargaining election among Pacific Gas and Electric Co. outside workers by a 3 to 2 vote.

Results of the election, in which 5,940 ballots were cast, were: California Gas & Electric Employees' Union, 3,550 votes; CIO's United Electrical & Radio Workers of America, 2,254 votes. Challenged, but having no bearing on the vote because of insufficient number, were 982 ballots. Ten ballots were declared void; 126 indicated no preference.

Final outcome of the election will, however, remain in doubt until the National Labor Relations Board rules on a protest filed by CIO charging P. G. & E. with coercion. The complaint, based on two sections of the labor relations act, asserts that the company favored the independent union, which it alleged it dominates, and interfered with the free organization of workers during the election.

In a similar election by employees of P. G. & E.'s street car and bus system at Sacramento, the Amalgamated Street Electric Railway & Motor Coach Employees, an A. F. of L. affiliate, was voted collective bargaining agent. The poll gave the A. F. of L. 79 votes; California Gas & Electric Employees Union, 60 votes, and the CIO, 8 votes.

Before December's floods the door of P. G. & E.'s Inskip power house (top) opened onto dry land. During the storm water flowed 18 in. deep through the open window. Workmen investigate flood damage in the Junction City plant on the Trinity River (center). Mark on shed wall shows height of flood. Debris against wall and switchrack at Inskip plant (bottom), typical of conditions at several other hydro stations

POWER LINE FUN - THE BEASTS HAVE THEIR DAY

The birds and beasts had a picnic last month at the expense of two Washington utilities.

A "hit-and-run" seagull succeeded in blowing the 100-amp. fuses on the Grays Harbor Railway & Light Co.'s Hume St., Aberdeen, line and putting lower F St. out of service.

On Puget Sound Power & Light Co.'s Entiat circuit a beaver scored his little success. While doing some construction work in a poplar grove, the beast felled several trees across the power lines and thereby broke one pole, two cross-arms and three wires. The result was darkness.

STORMS DAMAGE POWER SYSTEMS ON COAST

Wind, water and ice played havoc with Western power systems during the severe storms of early December. Record high water in northern and central California was responsible for most of the damage.

On the systems of the Pacific Gas and Electric Co. and San Joaquin Light & Power Corp. 10 hydro plants were flooded and the output from 15 was limited or temporarily suspended. Ten plants were isolated from the system due to transmission line failures and four were limited in output due to canal or conduit trouble. Checkup of total damage showed out-of-pocket losses to be nominal, the estimated cost of repairs as well as extraordinary fuel costs and purchased power being approximately $260,000.

There were no major interruptions except in the Weaverville, Downieville and Oroville areas and in some rural sections where line repairs were held up due to flood waters.

At the Bullard's Bar plant on the Yuba River water rose 20 ft. inside the power house when stream flow reached a record of 30,000 sec.-ft. Three men were rescued from the roof of the plant when their efforts to erect bulkheads around the station windows failed and water broke through the plate glass. They were removed with a rope sling rigged from the canyon wall.

Several feet of water inundated the A. G. Wishon power house on the San Joaquin River while five feet covered the floor of the Balch power house on the Kings River when water rose from 17 second ft. to 16,000. The latter will be the last plant in the region to open, the date now being set for Feb. 15.

Sierra-Pacific Power Co. suffered comparatively slight damage. Three poles carrying power lines to the Sutro St. substation, which serves north and east Reno, were washed from their bases in the Truckee River, disrupting service. Underpinning of the long flume supplying the Fleish power house was torn out by the raging river.

In Washington, Puget Sound Power & Light Co. linemen were kept busy maintaining service when annual winter snowstorms coated wires with half-inch ice and loaded trees to the breaking point.

"AND IS OUR FACE RED"

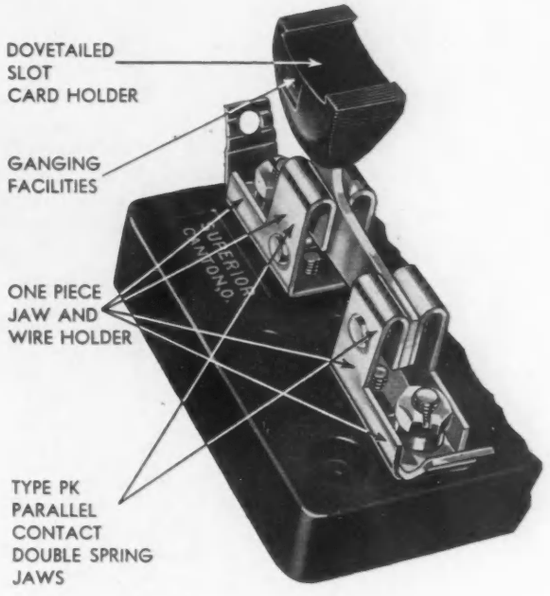
If You DON'T Know

That Superior is Furnishing

Superior Test Switches With

"ONE-PIECE JAWS"

JUST LOOK AT YOUR NEXT SHIPMENT OF SUPERIOR TEST SWITCHES FOR THIS IMPORTANT IMPROVEMENT


DOVETAILED SLOT CARD HOLDER
GANGING FACILITIES
ONE PIECE JAW AND WIRE HOLDER
TYPE PK PARALLEL CONTACT DOUBLE SPRING JAWS
SUPERIOR CANTON O.

SUPERIOR SWITCHBOARD & DEVICES CO.

CANTON, OHIO

SUPERIOR
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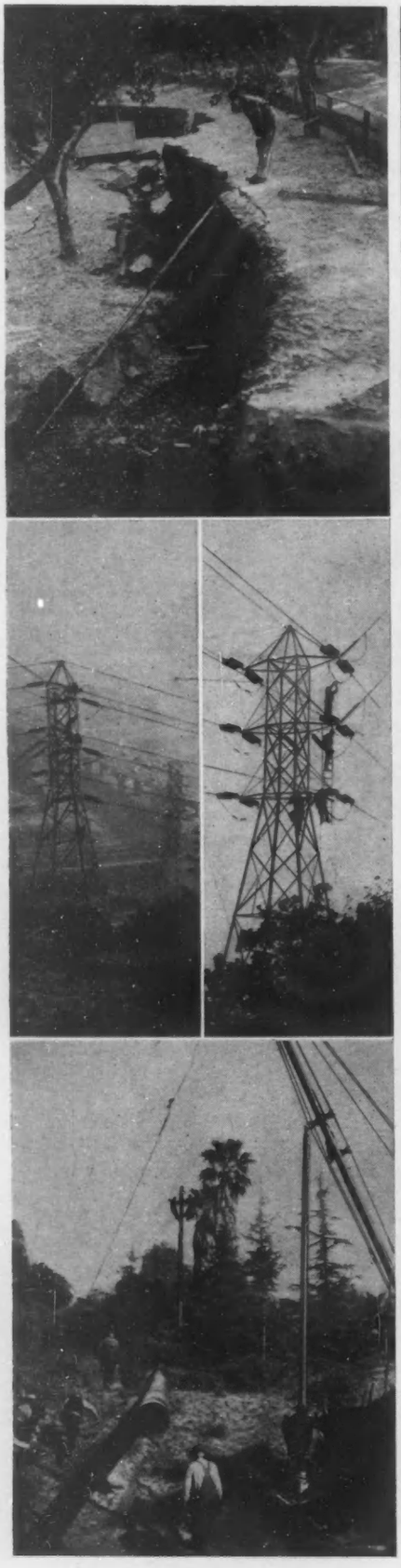
Been at it Since 1920



Day before the landslide, "moving mountain" began to accelerate its slip. Bureau crews worked fast to cut over the 110-kv. circuits, thus isolating the slipping tower.

Transmission Lines Detour Moving Mountain

Perhaps Los Angeles' "moving mountain" got more attention than it deserved but the emergency it imposed on the Bureau of Power & Light got less. One tower of the Bureau's 110-kv. twin-circuit line from its Aqueduct hydro plant to Station A stood in the center of the danger zone.

Day after the hill started its slow motion descent, 110 men began construction of a line to detour the moving ground. By the second day following, the first circuit had been cut in. Three days later the job was complete. Two single-circuit lines, totaling 19 wood poles, carrying 7,500 ft. of 300,000-circ.mil copper, skirted the sliding hill. Both circuits were in service just 24 hours before the mountain rumbled and plunged 60 ft. to Riverside drive, carrying with it the isolated tower.

San Francisco Replies in Hetch Hetchy Case

Federal government's case to enjoin the City of San Francisco from further sale of Hetch Hetchy power to the Pacific Gas and Electric Co. was answered last month when city attorneys filed a brief in federal court arguing that the suit should be thrown out. Cited in support of their contentions were 272 previous cases.

The brief maintained that the city's contract with P. G. & E. is a "bona fide agency" agreement for distribution of power and not, as the government contended in its brief, a sale of power agreement.

Further arguments were that if the government succeeds in having the contract branded a violation of the Raker Act, which prohibits sale of municipal power, the city will lose revenue representing 28c in the tax rate; that the city is not only paying $30,000 annual rental for the Raker grant but has also spent millions in building roads and trails in Yosemite National Park, and that, finally, Congress, in attempting to regulate San Francisco in the sale of Hetch Hetchy power, acted beyond its constitutional authority.

PRODUCTION OF ELECTRICITY for public use in the U. S. totaled 118,778,000,000 kw.-hr. in the year ending Oct. 31, the Federal Power Commission reported last month. Total production in October was 10,148,000,000 kw.-hr., a 1.7 per cent increase over September and a 4.4 per cent increase over October 1936.

Bids Opened On Coulee High Dam Construction

Bids on the completion of the Bureau of Reclamation's high dam development at Grand Coulee were opened Dec. 10 at Spokane. Low bid of $34,442,240 was submitted by the Interior Construction Co., Oakland, comprising the Mason-Walsh-Atkinson-Kier Co., Six Companies, Inc., and General Construction Co. Only one other estimate was submitted.

Covered by the contract are completion of the dam to its full height of 553 ft., the west bank power house and the wing dam pumping plant (without machinery). Four years are allowed for the work.

In spite of the fact that it promised closer bidding, a proposed contract clause under which the government would have assumed partial financial responsibility in the event that wages should have to be raised was discarded before the bids were submitted. Acting Comptroller-General R. N. Elliott is known to have disapproved the proposal.

Pending acceptance of the new bid, the Mason-Walsh-Atkinson-Kier Co. announced that it expected to finish work on the foundation of the dam early this month.

Second Steam Plant To Be Built By P. G. & E.

Contract for a second 35,000-kw. steam plant to be built by Pacific Gas and Electric Co. on property of an oil refinery remains only to be approved by the California State Railroad Commission. Almost an exact duplicate of the plant now being built at Tidewater Associated Oil Co.'s refinery at Avon, Calif.,* the new one is scheduled to be completed in 1939 in nearby Martinez for the Shell Oil Co.

Both contracts provide for sale of electric energy and steam to the refinery, and for purchase from the refinery of petroleum sludge or equivalent fuel.

Like the first plant, contract for which was approved in October 1937, the one at Martinez will leave considerable capacity available to the utility, demand at the refinery being of high load factor and in the neighborhood of only 4,500 kw.

Cost will approximate $5,000,000. A single turbine will take steam at 1,500 lb., 950 deg.

Being negotiated are plans for a third similar unit for the Union Oil Co.'s refinery at Oleum, also in the same area east of San Francisco Bay.

* Electrical West, October, 1937, page 74.

Old Cap Carter

puts a steel mill to work

A million American dinners tonight, of delicious deep-sea fish, would never be eaten except for steel. First the old fisherman must mend his nets with a steel needle. Then he puts to sea in a steel boat, unloads his catch into a steel trough, cleans and prepares the fish with steel implements, and finally ships the fish in steel cans plated with tin.

Last year American housewives opened many thousands of tons of these cans .... you could almost say we would be without sea food if it were not for steel.

In the lives of every one of us, steel plays a vital part. That fact is never for a moment forgotten at Youngstown, and research goes on continuously, to keep down the costs and increase the value of the countless steel products you use every day.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO

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Hypotheses Mark Ross' Bonneville Activities

Continuing his round of activities last month, Bonneville Administrator J. D. Ross took recourse in the hypothetical words, "just as soon as" and "if." In a series of statements Ross announced:

Just as soon as Bonneville begins operating the present installed capacity of 86,400 kw. will be marketed;

Just as soon as congress makes the necessary appropriation two additional units to double the present Bonneville power output will be installed, and

"If Grand Coulee dam wants Bonneville power and the government will give me the money I will bring transmission lines from Bonneville dam to Grand Coulee."

Other Bonneville activities included acceptance by the northwest planning commission of Ross' recommendations for the Bonneville-Grand Coulee and Bonneville-Portland-Salem transmission lines; announcement by the Federal Power Commission that it would soon make known the write-off on the project, and speculation as to whether Isaac Comeaux, chief city accountant at Seattle, will accept the supposedly offered position of assistant to Ross.

RESOLUTION MAKING APPLICATION to Bonneville Administrator J. D. Ross for 40,000 kw-hr. of power has been approved by the Snohomish County, Wash., utility district. The resolution is not binding upon the district but is for the purpose of giving Ross figures on which to base estimated transmission line construction necessary.

CONSTRUCTION OF A PLANT for sodium chlorate manufacture will shortly be begun on a site near Bonneville Dam by Pennsylvania Salt Mfg. Co., Philadelphia, and Chipman Chemical Co., Bound Brook, N. J.

Patent Sought On Ruby Dam Design

Seattle City Lighting Department was last month authorized by the local Board of Public Works to apply for a patent on the Ruby Dam design. The action came as a counter-move against an infringement of patent law-suit allegedly threatened by Lars C. Jorgenson, San Francisco engineer who claims that the dam is based on the constant arch dam principle which he invented and for which he has a patent application pending.

J. D. Ross, superintendent of Seattle City Light, denies Jorgenson's contention and asserts that the Ruby Dam design was made by the department.

Flathead Project 76 Per Cent Complete

Montana Power Co.'s Flathead hydroelectric development near Polson, Mont., is more than 76 per cent complete. At right is an aerial view of the dam which will eventually tower 200 ft. and form a lake of 1,100,000 acre-ft. Above is a top view of the scroll case through which water will rush to generate 56,000 kw. of electric energy. When the project is completed on or before July 1, 1938, total installed capacity of the utility will be raised from 294,000 to 350,000 kw.

Mountain States Bond Issue Killed

Federal Power Commission last month denied the application of Mountain States Power Co. for authorization to issue $8,000,000 of first-mortgage bonds and $700,000 of unsecured serial notes to refund the company's indebtedness on the grounds that the plan, "conceived at the last moment under most unfavorable conditions involving excessive costs and expenses," is in effect "merely a temporary avoidance of the frank facing and thorough-going solution of applicant's financial problems."

The commission pointed out that cost of reorganization under Sec. 77-B of the National Bankruptcy Act would be less than the expense under the plan proposed.

BIDS ON STRUCTURAL STEEL for supporting structures of Metropolitan Water District and Southern California Edison Co. transformer circuits at the Boulder switchyard were received by the Bureau of Reclamation, Denver, until Jan. 3.

Holding Company Plans Involve Coast Utilities

Standard Gas & Electric Co. has petitioned the U. S. District Court in Delaware to set a date for a hearing on the company's plans to register as a holding company with the SEC.

By an agreement accompanying the plan, the utility will seek authority to grant to holders of the company's $73,649,500 of 6 per cent notes and debentures a choice of retaining their present securities or exchanging each $1,000 principal amount thereof for $500 in principal amount of new 4½ per cent sinking fund debenture plus 25 shares of the common stock of Philadelphia Co., two shares of the common stock of Pacific Gas and Electric Co. and after a four-for-one reclassification, three shares of the common stock of San Diego Consolidated Gas & Electric Co.

SCHEDULED FOR COMPLETION last month was Washington Water Power Co.'s 52-mi., 110-k.v. transmission line from the Chelan power station to the Holden mine of the Howe Sound Co.

★ HIGH EFFICIENCY

TYPE HAE RURAL LINE TRANSFORMER

- Sectional HV Winding
- Spool Barrier Insulation
- Regulating Taps and Tap Changer
- Low Losses and Good Regulation
- Electric Seam Welded Tanks
- Stud Bushings — Clamp Connectors
- Three Point Suspension
- Shipped Filled with Oil

Type HAE Rural Line Transformers are described fully in Leaflet 2256. Send for your copy today.

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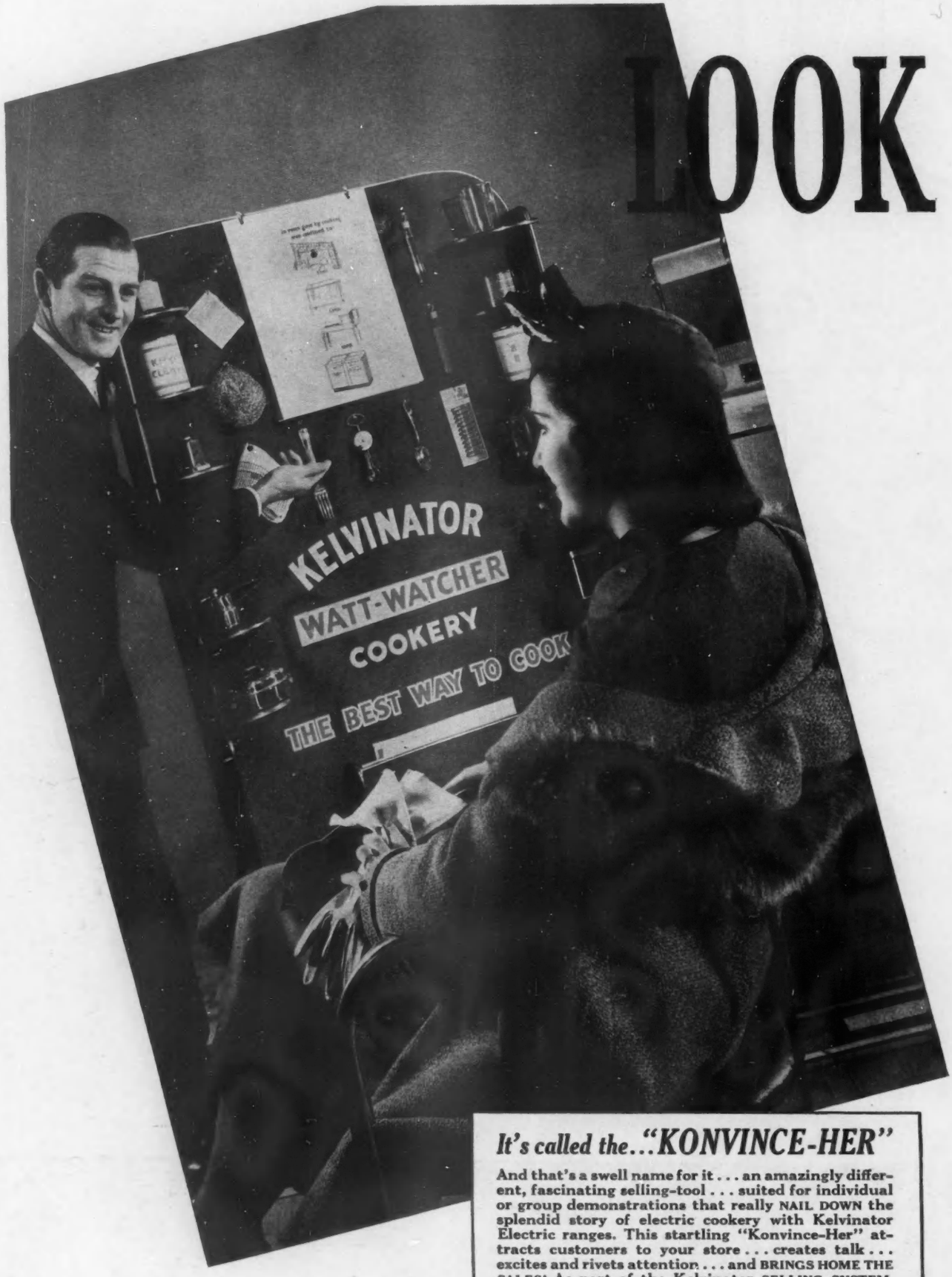
TRANSFORMER DIVISION

ALLIS-CHALMERS

MILWAUKEE WISCONSIN



LOOK

It's called the..."KONVINCE-HER"

And that's a swell name for it . . . an amazingly different, fascinating selling-tool . . . suited for individual or group demonstrations that really NAIL DOWN the splendid story of electric cookery with Kelvinator Electric ranges. This startling "Konvince-Her" attracts customers to your store . . . creates talk . . . excites and rivets attention . . . and BRINGS HOME THE SALES! As part of the Kelvinator SELLING SYSTEM, your sales people are personally trained in use of the "KONVINCE-HER". See it . . . and watch it WORK.

★

—THIS IS ONE SENSATIONAL PART OF A HOT, SURE-FIRE SELLING SYSTEM FOR YOUR PEOPLE—ON KELVINATOR'S "WATT-WATCHER" ELECTRIC COOKERY

IT ISN'T TOO HARD for you as a retailer to *buy* a good line of electric ranges.

This year Kelvinator has put out a great line of electric ranges . . . that are easy to SELL!

But we're not just sliding it over into your lap.

We're giving you—IN ADDITION TO A GRAND LINE—a simple, complete, sure-fire SELLING SYSTEM. To close sales for you!

(1) A Kelvinator home economist trains your people in electric range demonstration. (2) Sales training courses for your salespeople. (3) SOUND FILMS on electric cookery advantages in general and Kelvinator specifically. (4) A "visualizer"—for carrying this great story actually INTO PROSPECTS' HOMES . . .

Plus (5) this sensational, exciting innovation in electric range selling . . . which is shown here, in use. It is a "natural" . . . a "honey" . . . an irresistible aid in getting those names on the dotted lines!

This is genuinely something for you to go out after, right now, Friends!

KELVINATOR, DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT, MICHIGAN

IT'S A GREAT LINE OF RANGES . . . EASY TO SELL

One of the most beautiful and economically efficient electric ranges ever produced . . . the handsome new Kelvinator Model ER70.

Kelvinator

ELECTRIC RANGES

★

KLEIN
"Lightweight"
CLIMBERS

Klein "Lightweight" Climbers are built to the minimum weight possible consistent with maximum safety. Every pair is tested exactly the same as are the old time tried Standard Climbers. The lineman can throw his weight on these climbers with confidence —they are Klein's!

DISTRIBUTED THROUGH JOBBERS

Foreign Distributor: International Standard Electric Corp., New York

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

- ☐ Lightweight Climbers.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ Klein Kord Fabric Safety Straps.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 Chicago, Ill USA
3200 BELMONT AVENU

FPC Denies Transfer of Utility Facilities

Joint application for transfer of the facilities of Inland Power & Light Co. in Oregon and Washington to Pacific Power & Light Co. was denied last month by the Federal Power Commission.

Grounds for the decision lay in the fact that "the Federal Power Act is not intended to require the merger of two operating companies merely because they operate within the same territory and each supplements the activities of the other. The proposed transfer will (not) tend toward the economical and more efficient development of an integrated public utility system, the ultimate end and aim of which is to improve service or reduce rates to the consuming public."

●

EXPECTED IN THE NEAR FUTURE is the decision of the District Court of Otero County, Colo., on the right of the La Junta City Council to acquire a municipal electric power plant and distribution system without submitting the ordinance for approval to the taxpaying electors.

●

ELECTRIC BOND & SHARE CO. and 26 subsidiary companies last month asked the U. S. Supreme Court to review the decision of the Second Circuit Court of Appeals upholding the registration provisions of the Public Utility Holding Company Act of 1935. The petition charged that the act infringes upon the constitutional rights of the company and its subsidiaries and deprives them of their ordinary civil rights.

●

WORK ON SAN JOAQUIN LIGHT & POWER CORP.'s $15,000 power line in Hunter Valley, Calif., was to have been completed late last month. Starting at the Juniper mine near Bear Valley, the line will serve two reopening mines and a number of farms.

●

NEVADA-CALIFORNIA ELECTRIC CORP.'s new Kramer substation was cut into service late in November. Meanwhile preparations were being made to reconstruct the 88-kv. section of the Colorado River substation and increase the substation capacity to 7,500 kva.

●

SEATTLE CITY LIGHTING DEPARTMENT'S plan to construct a new Skagit transmission line across Mercer Island, Lake Washington and southeastern Seattle was abandoned recently when the City Council utilities committee voted to postpone the program indefinitely and continue negotiations with the City of Renton for a right-of-way.

FIRST OF A SERIES of 48 state reports showing electric rates in effect Jan. 1, 1937 for all classes of customers has been issued by the Federal Power Commission. Designated as "1937 Rate Series B," the reports will cover rates in practically all communities of 250 or more population. Western states covered to date are: Oregon, Montana, Nevada, Utah, Arizona, Colorado, Washington, New Mexico.

●

SAN FRANCISCO ELECTRICAL CONTRACTORS ASSN., Inc., was last month awarded the verdict in a case brought against Arc Electric Co. in California Superior Court. Involved was the validity of a decision by an arbitrator as set up in the contract agreement between members of the association under California's arbitration law. Arc Electric Co. petitioned the court to set aside the decision. Legality of the contractors' agreement was felt to be established by the court ruling.

●

DRIVER'S LICENSE SCHOOLS are being conducted for employees of Puget Sound Power & Light Co. under the direction of the subcommittee on automotive practices of the Everett, Wash., District Safety Committee.

●

NEW 12,000-KW. SUBSTATION being built by San Diego Consolidated Gas & Electric Co. at Front and Robinson Sts., San Diego, is scheduled to go into operation this spring. The unit will serve the Hillcrest residential district.

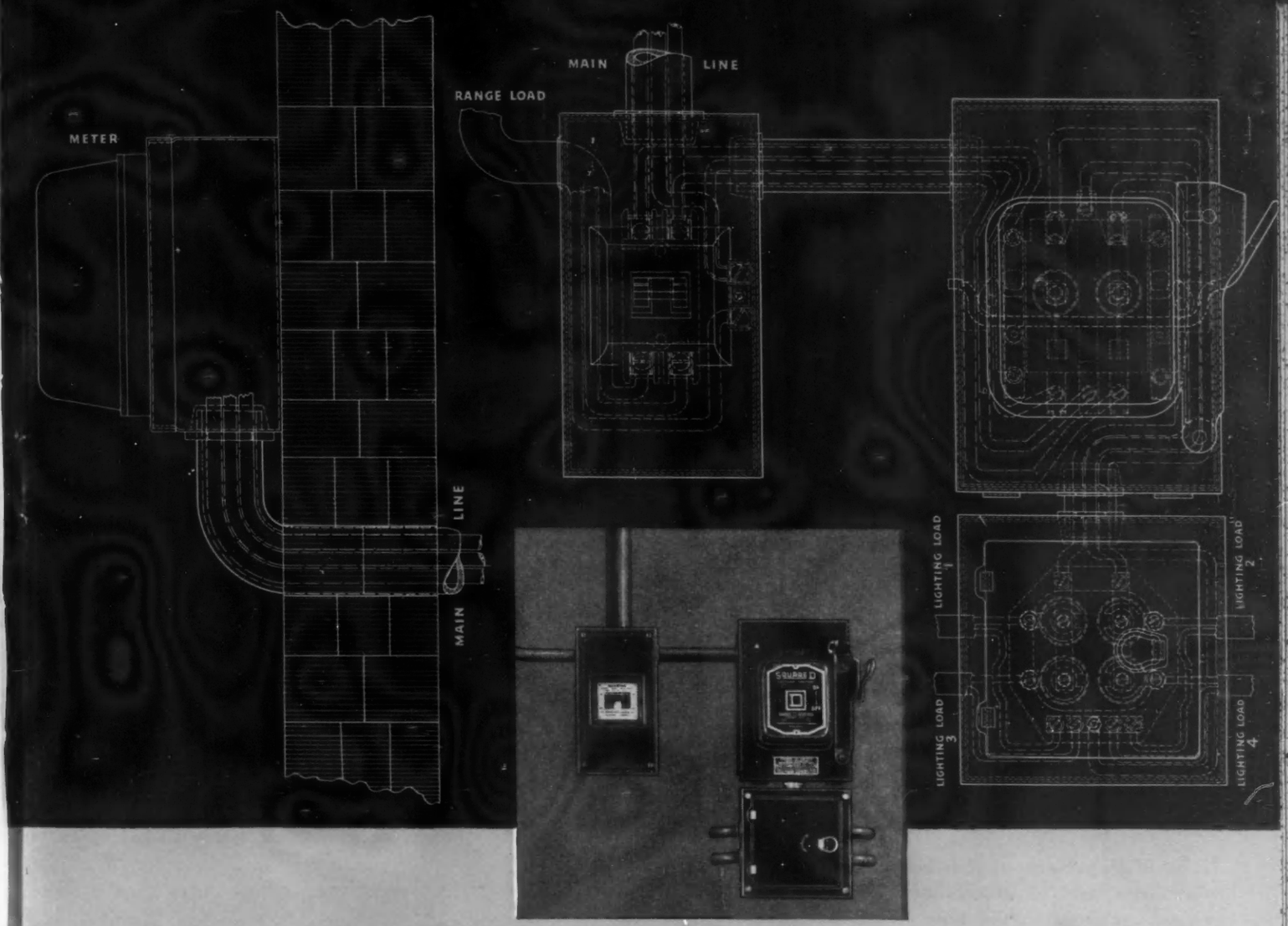
●

REA ACTIVITIES

The supposed formula—consumer cooperative plus REA aid equals low electric rates—failed to prove itself last month when the Rural Electrification Administration proposed a $3.50 minimum monthly bill, at 10c per kw.-hr., for the 2,600 member customers of the Inland Empire Electrification, Inc., of Spokane, Wash.

Other brackets for monthly consumption are: next 45 kw.-hr. at 5c per kw.-hr., next 120 at 3c, and all over 200 at 1¾c. Thus the first 200 kw-hr. cost $9.35 at an average of 2.4c per kw-hr. The project has transmission lines in Spokane, Adams, Whitman and Franklin counties.

REA last month made its first allotment of funds to a project—in Lancaster, Ohio—complying with the new pre-allotment requirements. Included in



. . . IT IS EASY TO ADD A RANGE OR WATER HEATER CIRCUIT WITH A SQUARE D MULTI-BREAKER

When the service entrance switch of a home has not sufficient capacity for the addition of electric range or water heater, it is easy and economical to add extra circuits by using a Square D Multi-breakeR. The Square D Multi-breakeR is service equipment and may be installed in parallel with existing wiring.

The 1937 National Electric Code permits up to six service subdivisions or branches, individually controlled with solid mains.

The new two-pole Square D Multi-breakeR sells at a new low price for circuit breaker protection — hardly more than a good switch and fuses. The installation costs less than replacing the service entrance switch with one of larger capacity.

Any electrical contractor installing electric range or water heater services should investigate this new Square D Type M Multi-breakeR. Explain the convenience of the Multi-breakeR and you have sold a wiring job.

Square D electrical appliances are available through electrical wholesalers everywhere

SQUARE D COMPANY

LOS ANGELES - DETROIT - MILWAUKEE

SQUARE D COMPANY CANADA LTD. TORONTO, ONTARIO

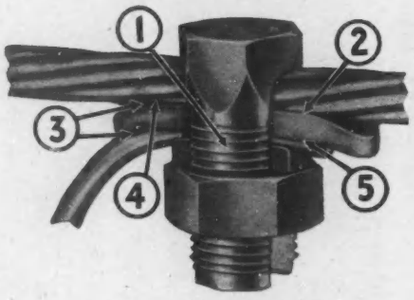
CALL IN A SQUARE D MAN

Reliable

Solderless Connectors

•

Aluminum to Copper Connectors



Features

• **1.** Perfect fit, accurately machined threads apply high pressure to joint.

• **2.** High pressure is distributed over large area of aluminum to prevent appreciable cold flow and consequent loosening after connector is applied.

• **3.** Copper and aluminum wires are well separated—a drop of water cannot bridge them and eat the line wire.

• **4.** Surface of spacer slug is hot tinned to give weather resisting coating and galvanized to prevent galvanic action with aluminum.

• **5.** The portion of spacer that contacts the copper tap wire is plain copper.

Here's an important contribution to the field of solderless connectors for aluminum to copper.

Write for Sample. Test its performance.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE • CHICAGO ILLINOIS

the new requirements are:

Detailed, true-scale project map showing location of every prospective customer; signed easements for the line from property owners; paid-up membership applications from signed customers; formal incorporation of a qualified organization to operate the project, with geographic representation on the board of directors of all parts of the project area; enough tentative preliminary negotiations for wholesale power to assure a supply of energy at a satisfactory rate.

CLARKS FORK POWER ASSN., Thompson Falls, Mont., has received an additional allotment of $9,000 to complete its 80-mi. rural line.

CONTINGENT UPON THE SELECTION of a board of directors comprising at least seven representatives from the area served, REA last month allotted $100,000 of the $198,000 requested to build 199 mi. of line to serve 465 customers in Curry County, N. M.

BENT-PROWERS RURAL POWER LINES ASSN., Lamar, Colo., has awarded a contract to the Chapin Contracting Co., Wichita, Kan., for building the entire project—162. mi of line. Low bid was $112,547.

DRISCOLL CONSTRUCTION CO., Pueblo, Colo., bidding $98,075, has been awarded a contract to construct the San Luis Valley Rural Electrification Co.'s 136-mi. line in Almosa County, Colo.

ADDITIONAL REA ALLOTMENT of $36,000 was last month awarded the Lower Valley Power & Light, Inc., Freedom, Wyo. Twenty-five thousand dollars is to be used to complete the generating plant.

CONTRACT WHEREBY Pacific Gas and Electric Co. will supply electric energy to serve 700 customers in Sierra, Plumas and Lassen Counties, Calif., was signed last month by Plumas Sierra Rural Electrification Cooperative. Meanwhile J. N. Laughlin, superintendent of the cooperative, issued a call for bids to be opened at Blairsden Jan. 8.

DECISION TO PROCEED with construction of the Nevada portion of a proposed new Boulder Dam power line and to delay work on the Arizona section pending determination of whether it is possible to distribute Boulder power through Nevada into Arizona was announced last month by John M. Carmody, REA administrator. Eighty-four of the line's 94 mi. will serve communities in Clark County, Nev. Remaining 10 mi. is to be built across the Colorado River into Arizona in the vicinity of Beaver Dam.

IMPERIAL IRRIGATION & POWER CO., El Centro, Calif., last month opened bids on construction of 600 mi. of line to supply electricity to some 1,800 customers.

BID OF $34,265 submitted by Homer G. Johnson, Portland, on construction of 42 mi. of rural line north of Prosser, Wash., was accepted last month by the Benton County Rural Electric Assn.

MOSCOW (IDA.) ELECTRIC CO. has been awarded a contract by Clearwater Valley Light & Power Assn. for wiring 47 houses in Latah County at an approximate cost of $5,000.

ABOUT PEOPLE

P. G. & E. Essay Contest Winners Announced

Winners in Pacific Gas and Electric Co.'s system-wide essay contest on the subject, "What I Think of My Job," were announced last month as follows: First prize, $100: Ralph W. Bird, sales department, East Bay division; second, $75, Florentine R. Camenisch, accounting department, Drum division; third, $50, James T. Mahon, overhead line construction department, San Joaquin division; fourth, $25, Arthur C. Danks, complaint investigation department, San Joaquin Light & Power Corp.

Divisional prizes of $10 each were awarded to: Milton J. Frey, Colgate division; W. J. Crabbe, Coast Valleys; A. M. Carah, DeSabla; Mancell R. Hough, Drum; Joseph S. Worthington, East Bay; Paul Suransky, general office; A. L. Fraser, Humboldt; J. Glenn Brown, Midland Counties Public Service Corp.; Ralph S. Nabors, natural gas; E. C. Hersam, North Bay; Roy L. Oxley, Sacramento; Russell J. Owen, San Francisco; D. W. Haire, San Joaquin Light & Power; Frances Prahser, San Joaquin; J. J. Breslin, San Jose; Maurice McClellan, Shasta.

•

E. L. WILLIAMS

E. L. WILLIAMS, Pacific regional household sales manager of Frigidaire division, General Motors Supply Corp., San Francisco, was last month appointed to the managership of the Los Angeles district. Mr. Williams' first association with the appliance industry was with Meter-Ice Corp.

•

HARRY MILLER is the new purchasing agent for Electrical Products Consolidated, Seattle. He succeeds Athol Baker who recently resigned to become assistant manager of the Agnew Hardware Co., Everett, Wash.

UP-TO-THE-MINUTE TESTING FACILITIES

guard the quality of ROEBLING Power Cable!

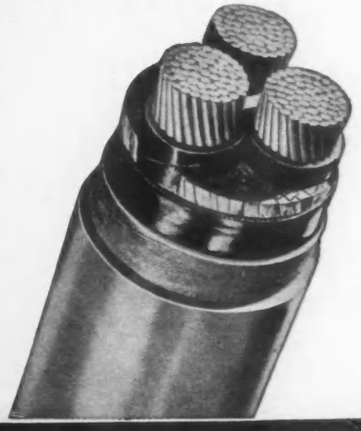
SHOWN is the Roebling Test Transformer Panel for producing stresses up to 400,000 volts, for high tension testing in the Power Cable Department. Similar equipment is available for lower voltage testing of varnished cambric and rubber insulated cables.

The Roebling Varnished Cambric Power Cable shown below is available in single, two and three conductor types; for a wide range of voltages; in all commercial sizes, with braided finish or lead sheath.

Metallic coverings of zinc, bronze, plain or galvanized steel tape or round wire armor of copper or galvanized steel wire can be supplied to these or other types of Roebling cables.

To meet power station, industrial, building, and other needs, Roebling offers over 60 types of high quality electrical wires and cables.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco Seattle Los Angeles Portland

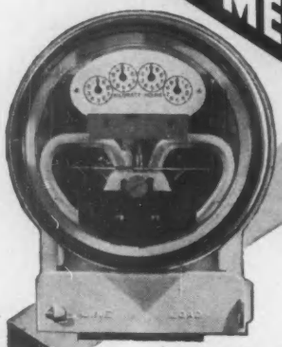


ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

TWO-ELEMENT SINGLE-DISK Watthour Meters are

Sangamo Type L-2-S Two-Element, Single-Disk, Socket Mounting Meter

MODERN METERS



Sangamo Type L-2-A, Two-Element, Single-Disk Meter in "A" Base

For MODERN LOADS

Western Offices:
LOS ANGELES
326 Subway Term. Bldg.
SEATTLE
220 Ninth Ave. N.
PHOENIX
1318 W. Lynwood St.
SAN FRANCISCO
1061 Howard St.
DENVER
1526 Blake St.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Miss Dorothy Stewart, formerly home economist for the State of Utah, has been named home economist for the Westinghouse Electric Supply Co., Salt Lake City. She will assist dealers and salesmen in electric range promotion.

●

P. E. Shaad, following four years' work at Schenectady, has been transferred to the General Electric Co.'s San Francisco office where he is a member of the engineering staff.

●

Mrs. Mercedes Gaffney, Los Angeles Bureau of Power & Light home economist, recently returned from Chicago where she attended the National Home Service Conference sponsored by Edison General Electric Appliance Co.

●

Harry Buffum, president and general manager of Buffum's Department Store, Long Beach, Calif., has been elected a member of the board of directors of Southern California Edison Co., Ltd.

●

R. W. Brown, Allied Industries, Inc., salesman for the past thirteen years, has been named manager of the Los Angeles branch of the company.

●

F. A. Parnell, widely known in the West, has been appointed sales manager of General Electric Co.'s conduit and wire sales section. He was formerly manager of sales promotion for construction materials. H. E. Merrill will succeed him.

●

R. C. Padgett, former range specialist for the General Electric Co., working out of Cleveland, has been named representative on Cleveland merchandise for the Northwest.

●

To put the engineering department in close touch with field problems and activities, Pacific Power & Light Co. has created the new position of division manager and announced the appointment of C. L. Brown as field representative at Walla Walla, Wash., and A. E. Bond at Yakima, Wash. The two men will be direct agents of the Portland engineering department.

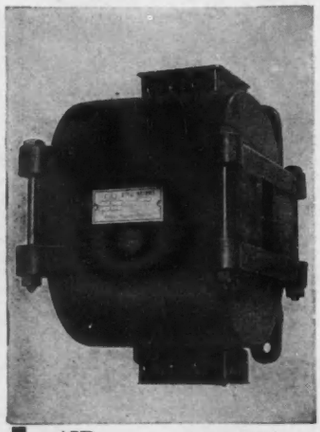
●

Harold B. Wells, Los Angeles Bureau of Power & Light, and Dean P. Cady, Southern California Edison Co., have been named sales engineers in southern California for Maydwell & Hartzell.

●

William Moody has joined the General Electric Co. staff at Los Angeles. After graduate work at the University of California, Mr. Moody spent four years with G. E. at Schenectady prior to being transferred West as an engineer.

YOU SAVE



With JEFFRIES

AIR COOLED TRANSFORMERS

● With a Jeffries Air Cooled Transformer money can be saved. The Air Cooled construction lengthens the life of the transformer and lowers repair costs. Plant expansion and extension can be made economically for a Jeffries Transformer provides the voltage change at the point desired without the need of long and expensive conduit runs. Besides a complete line of standard transformers, special designs and voltage furnished to order. Type S. S. Transformer 1 to 5 K. V. A. illustrated.

JEFFRIES TRANSFORMER COMPANY
5706 LONG BEACH AVE., LOS ANGELES

WHERE is Business Going in 1938?

Where will it leave you next December? A clear picture of what to look for — definite, concise interpretations of economic trends and prospects — is in the annual

BROOKMIRE FORECASTER for 1938

● Send this advertisement and One Dollar for this Forecaster plus a Special Report on "Why Renewed Progress of the Business Cycle Should Follow the 1937 Interruption."

● You will also receive three important current Brookmire Bulletins covering 1, Annual Stock Forecast with the Brookmire List of Approved Stocks, 2, Annual Bond Forecast with Bond Investment Program for $100,000, 3, Planning for consistent Investment Achievement.

Five valuable guides for $1.00
Order your copies today—the edition is limited

BROOKMIRE
Corporation—Investment Counselors and Administrative Economists—Founded 1904
551 Fifth Avenue, New York
82

VARNISHED Cambric Insulated Cables are showing superior advantages in many cases where loads have been increased. This type of insulation has the ability to withstand continuous high temperatures without deterioration, and it is not injured by contact with insulating or lubricating oils or greases. For these reasons it has become widely used for apparatus cables, and motor and generator leads where heat, high voltage and the effects of oil would shorten the life of rubber insulation.

American Steel & Wire Company Varnished Cambric Cables are available in either braided or lead sheathed insulation and are suitable for service up to 10,000 volts, and higher if lead sheathed or properly shielded.

For applications where heat resistance is of primary importance we have developed a special type of Varnished Cambric Cable which is even more resistant to continuous high temperatures than the standard type. Inquire about our "high-temperature" varnished cambric.

Loads have been increased and may be increased further. We will be glad to show you how our Varnished Cambric Cables can be of economical assistance to you.

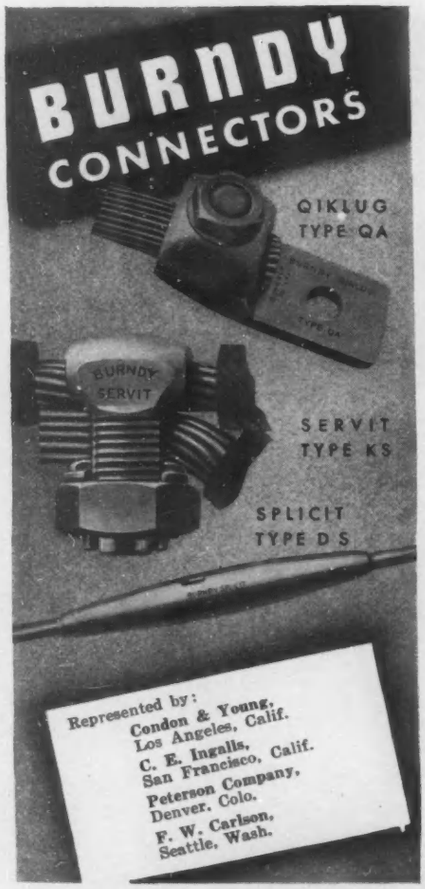
VARNISHED CAMBRIC INSULATED CABLES

COLUMBIA STEEL COMPANY · *San Francisco*

Pacific Coast Distributors of Varnished Cambric Insulated Cables for American Steel & Wire Company

United States Steel Products Company, New York
Export Distributors

UNITED STATES STEEL



More light means more sales—every merchant knows that. No wonder contractors find Sterling Lite-Flo Reflectors such a powerful ally in closing lighting contracts.

In thousands of show windows these remarkable reflectors have multiplied lighting effectiveness using the same lamps—the same current—the same operating cost. Catalog on request.

H. B. SQUIRES CO., Representative
Los Angeles—San Francisco—Seattle

REFLECTOR & ILLUMINATING CO.
1431 W. Hubbard St. CHICAGO

IN MEMORY OF the late A. G. Wishon, founder of San Joaquin Light & Power Corp., the company last month changed the name of Power House No. 1 on the San Joaquin River above Auberry, Calif., to the A. G. Wishon Power House. The station has been known by its numerical designation since 1895, when it was erected as the first of a series of hydro-electric plants.

●

WHOLESALERS APPOINTED by the National Electrical Wholesalers Assn. to cooperate with the International Association of Electrical Inspectors include B. S. Manuel, Westinghouse Electric Supply Co., Los Angeles, and O. B. Stubbs, Stubbs Electric Company, Portland, Ore., as representatives of the southwestern and northwestern sections respectively.

●

RUSS SIEVERS, formerly with the George Gray Co., has become affiliated with Buzzell Electric Works, San Francisco, as sales engineer. Mr. Sievers is a brother of F. O. Sievers of the firm, Kuchel & Sievers.

●

F. E. BLAKE recently resigned his position as general manager of Hawaiian Electric Co. in order that he might retire to private life. L. A. Hicks succeeds him as general manager. Also retired and now living at Palo Alto, Calif., is Tom McGrath, general superintendent of the utility.

●

A. E. FLEMING of the commercial lighting sales staff, Utah Power & Light Co., has resigned to become lighting specialist for the General Electric Supply Corp., with headquarters in Denver, Colo. Mr. Fleming has been secretary-treasurer of the Utah Chapter, Northwestern Section International Association of Electrical Inspectors in Salt Lake City, and was active in the arrangement of the inspectors convention in that city in August. The new secretary of the Chapter is W. W. Cox, Salt Lake City.

●

CLARENCE P. DAY, for 30 years connected with the engineering and construction business in southern California, has opened an electrical appliance shop, carrying the complete Fairbanks-Morse line, Woolwine ranges and RCA products, at 754 E. Colorado St., Pasadena. Park O. Schaeffer is manager.

●

R. U. MUFFLEY, Central district commercial manager for Puget Sound Power & Light Co., has been named president of State Washingtonians, Inc., an organization to advertise the state and promote tourist travel.

Crapo
GALVANIZED PRODUCTS
Seven Wire
Steel Strand
Telephone and
Telegraph Wire
Where strains and stresses are heaviest, where corrosion takes its greatest toll, Crapo Galvanized Steel Strand and Telephone Wire long ago demonstrated their outstanding superiority. The heavy pure zinc galvanized coating, maximum tensile strength and proper ductility insure longer life and lower maintenance cost. Insist upon Crapo Galvanized Products for better performance under all conditions!
Indiana Steel & Wire Co.
Muncie, Indiana
Crapo Galvanized Products are available in all standard grades and sizes.
INDIANA STEEL & WIRE CO.
MUNCIE, IND.

MAYDWELL

Glass Insulators

All Standard Numbers
For All Purposes

Made of high quality materials in a modern Pacific Coast plant producing an unusually tough glass to withstand all severe service conditions.

MAYDWELL & HARTZELL
INCORPORATED
Electrical Engineers and
Manufacturers' Representatives
Los Angeles ★ San Francisco

Santa's Helpers

Women employees of Southern California Edison Co. turned Santa's helpers in the fourteenth annual doll contest sponsored by the Edison women's committee. Little girls in needy families received the 36 dolls entered as Christmas presents. Above are the winners with their entries: Lillian Presnell, Ithiel Morden and Edith Bewley.

R. H. MANAHAN, chief of the electrical division, Department of Building and Safety, Los Angeles, was recently appointed a member of the electrical council of Underwriters' Laboratories. He fills the position made vacant by the death of Harry Beecher.

●

E. J. DOUGLAS, manager of Enterprise Electric Works, San Francisco, was elected president of the Electric Motor Dealers Assn. of Northern California, at its annual meeting in December. Dan Bronson, California Electric Co., Ltd. Oakland, was named vice-president; Ken Ryals, Stone Ryals Electric Co., San Francisco, secretary; Francis O. Sievers, Kucher-Sievers Electric Works, San Francisco, treasurer, and R. H. Conrad, Oakland, and Frank Cole, West Coast Electric Works, San Francisco, directors.

●

EDWARD S. SIEVERS, formerly with the Weston Instrument Co., Newark, N. J., has been appointed sales engineer specializing in the Weston line by A. A. Barbera of Los Angeles, manufacturers representative.

●

WARREN MCMAHON, formerly salesman for the Portland General Electric Co., is the new manager of the Hotpoint home appliance department of West Hardware Co., Portland.

●

EDWARD A. BRAND, commercial engineer for the Buffalo, Niagara & Eastern Power Corp., received the James H. McGraw Award Medal for Cooperation.

New nut housing. Locks Anchor firmly on rod. Rod cannot slip thru Anchor when being installed.

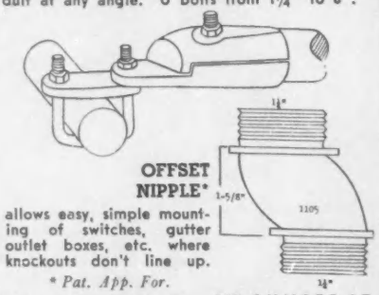
EVERSTICK ANCHORS...

Engineers appreciate Everstick features which assure safety, long life and ease of installation in any soil condition. A complete line of 3 types of expanding Anchors and rigid types of Cone Anchors. All sizes and holding capacities. Write for Everstick literature including new folder on Rural Electrification Lines.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

★ *The* HARTMAN *Line* ★

GROUND CLAMP—
Is threadless. Receives rigid or thin wall conduit at any angle. U bolts from 1¼" to 6".



OFFSET NIPPLE*
allows easy, simple mounting of switches, gutter outlet boxes, etc. where knockouts don't line up.

* *Pat. App. For.*

B. HARTMAN
168 SUNSET ST.
LONG BEACH, CAL.

DEATHS

Charles B. Clendenen

Charles B. Clendenen, Pacific division manager of the National Carbon Co., died in Los Angeles Dec. 15 from complications following an appendicitis operation. A native of Indiana, Mr. Clendenen joined the Prest-O-Lite Co. in Indianapolis in 1910. In 1912 he was transferred to New York, eventually attaining the position of sales manager of the company.

Upon the formation of the Union Carbide & Carbon Co. in 1918 he was made assistant to the general manager of the National Carbon Co. He came to the Pacific Coast in 1921 as office manager at San Francisco. In 1926 he was promoted to sales manager of the Pacific division and in 1927 Pacific Coast manager. At the time of his death he was president of the Ben Franklin Electric Club of Northern California,

●

John B. Myers

John Burnham Myers, manager of the Bingham division of the Utah Power & Light Co. since 1918, died last month of pneumonia. He was 68.

Born in Kentucky, Mr. Myers lived in Utah for 40 years. From 1908 to 1912 he served as chief electrician for the Knight Mining Co. and the Knight Power Co. at Eureka. He became Eureka division manager for the Utah company in 1913, serving in that capacity until his transfer to Bingham.

●

C. P. Randolph, Jr.

C. P. Randolph, Jr., vice-president in charge of engineering of the Edison General Electric Appliance Co., died at the Mayo Clinic Dec. 7. A pioneer in the heating appliance field, Mr. Randolph was well known in the West through his studies of promotional electrical rates. He was one of the country's foremost experts on this subject.

Commenting on his contribution in designing and standardizing the manufacture of load building appliances whose load characteristics would justify the lowest possible rates, one utility engineer paid this tribute to Mr. Randolph: "The industry's loss will depend upon the measure in which both the manufacturers and the utilities succeed in properly coordinating their promotional efforts on the sound economic bases established by his researches."

●

J. G. MONAHAN of the Engineering and General Supply Co., manufacturers' representatives, Los Angeles, died in that city Dec. 14. Mr. Monahan was perhaps best known for his many years of sales activity for the Sangamo Electric Co., one of the principals represented by his organization. Succeeding him as Sangamo district manager in southern California is Harry W. Wittenburg, assistant district manager since 1935.

●

JOHN R. OSBORNE, employee of the Utah Power & Light Co. for the last 22 years, died recently. He was associated with the credit department at the time of his death.

●

FRANK HERGET, one of the pioneer electrical contractors in San Francisco, proprietor of Electric Supply & Repair Co., died early last month.

●

FRANK B. BLACK, founder and chairman of the board of the Ohio Brass Co., died last month of heart trouble. He was 72 years old.

●

SAMUEL S. GORDON, director of Pacific Power & Light Co. from 1910 to 1933, died recently after a two-month illness. He was 87.

●

SPEAKERS

At meetings in eastern Montana and Wyoming. Les Johnson, district representative of the General Electric Co., Salt Lake City: "The Importance of Adequate Wiring."

At the Madera and Fresno Teachers' Institute. Dr. R. S. French, president of the Sight Conservation Council of Northern California and principal of the California School for the Blind. At the Kings County Teachers' Institute. Clark Baker, executive secretary of the council, Leo Giannini and Gregory Engelhard.

Before the Air Conditioning Society of San Francisco. Dr. John B. Lagen, University of California Hospital: "Medical Aspects of Air Conditioning." Gist: In spite of activities which would have spread colds to others under ordi-

Geo. E. Honn Co.
420 MARKET STREET
SAN FRANCISCO, CALIFORNIA

MANUFACTURER'S REPRESENTATIVE FOR:

TREE TRIMMING EQUIPMENT
● PARTLETT MANUFACTURING CO.
FRICTION AND RUBBER TAPES
● CLIFTON MANUFACTURING CO.
CROMPTON TONG TEST AMMETER
● COLUMBIA ELECTRIC MFG. CO.
PYREX INSULATORS
● CORNING GLASS WORKS
● PREWER-TITCHENER HARWARE
TRANSFORMERS
● GARDNER ELECTRIC MFG. CO.
Power and Distribution Transformers
● LEE SKIPWITH & CO., INC.
Niagara Air-Insulator Current Tran formers
CABLE GRIPS
● KELLEMS PRODUCTS, INC.
GROUNDLINE POLE TREATMENT
● OSMOSE CORP. OF AMERICA
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOISTS
● JASPER BLACKBURN PRODUCTS CORP.
METERING INSTRUMENTS
● LANDIS & GYR., INC.
NEON MULTIPLE PLUG FUSE
● PACIFIC INDICATOR CO.
FUSES, CUTOUTS, PROTECTIVE DEVICES
● SCHWEITZER & CONRAD, INC.
UNDERGROUND TOOLS AND EQUIPMENT
● T. J. COPE, INCORPORATED
CAPACITORS
● CORNELL-DUBILIER CORP.
World's Largest Exclusive Mfrs. of Capacitors

"Yours for Quick Service, Reliable Products, Local Stocks"

nary conditions, complete air conditioning seems to retard the spread of such infections very materially. Same is true for asthma, hay fever and other nose and throat disturbances.

At the University of British Columbia —James Lightbody, B. C. Electric Railway Co. publicity director: "Psychology of Advertising."

At annual dinner of Engineering Institute of Canada, Vancouver branch. J. N. Finlayson, dean of the faculty of applied science at the University of British Columbia: "Engineering Education"; Maj. W. G. Swan.

If the commercial cooking load is to be further developed, salesmen of electrical equipment must be more than mere order takers. This was the keynote of the recent Third Annual Commercial Cooking Conference held in Portland by the Northwest Electric Light & Power Assn. It was sounded early in the meeting by A. K. Gaylord, Portland General Electric Co., and elaborated further by D. O. Bergey, Northwestern Electric Co., and John Byers, Dohrmann Hotel Supply Co.

Other speakers at the meeting included: M. R. Lund and Carl L. Hoffman, Washington Water Power Co.; C. T. Bakeman, Puget Sound Power & Light Co.; Robert Ray, Fowler Mfg. Co., Portland; O. C. Mayer, Idaho Power Co.; A. F. Douglas, F. S. Lang Mfg. Co., and A. W. Paterson and A. B. Barlon, Edison General Electric Appliance Co.

PROFESSIONAL SERVICES

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

Classified Section

- COST of undisplayed classified ads is 5 cents a word, minimum $1.00 insertion. Box numbers in care of our San Francisco office count as 10 words additional in undisplayed ads.
- RATES per column inch of displayed ads is $3.75.
- All classified ads are payable in advance.

ELETCRICAL WEST 883 Mission Street San Francisco, Calif.

Representative Wanted — Manufacturer of friction and rubber electrical tape will consider manufacturers' agent for Southern California and Arkansas. Give complete details. Address Box 140, Electrical West, 883 Mission St., San Francisco, California.

TRADE NOTES

REFRIGERATOR AND APPLIANCE distributorships in Seattle did some hop-scotching last month when the North Coast Electric Co., for several years Norge distributor in Washington and Oregon, changed over to the Crosley line and F. B. Connelly Co. substituted the Norge line for the Grunow line.

●

MAYDWELL & HARTZELL was last month named representative of Chase Brass & Copper Co. for the sale of bus bar products and tubular copper ground rods in Washington, Oregon, Nevada, Idaho, California and Arizona.

●

AXELRAD FURNITURE CO., Salt Lake City, was winner of Utah Power & Light Co.'s prize for the best November window display of I.E.S. lamps.

●

UTAH POWER & LIGHT CO.'s home service kitchen, Provo, Utah, has had its face lifted. Improvements made consisted of installing built-in cupboards, incorporating plug-in stripping for the use of small appliances, new lighting fixtures and a general cleaning.

●

PACIFIC RANGES is the name of a new store opened by Herbert Janzen at 44 E. Broadway, Vancouver, B. C. Line handled includes electric washers, ranges and smaller electrical appliances.

●

J. J. SOUTHARD, head of the Home Appliance Store, Lewiston, Ida., has sold his business there and moved to Spokane where he is now connected with the Taylor Electric, Hillyard.

●

TO KEEP PACE WITH increasing merchandising activities and to furnish better showrooms, MacDonald's Electric, Ltd., Victoria, B. C., has made extensive alterations in its building. Especially improved were facilities for display of the General Electric line in which the firm specializes.

●

TAYLOR BROTHERS CO., largest department store in Provo, Utah, is enlarging its home appliance department to three times the present size.

●

I. R. JOHNSTON electric store, Spokane, has been purchased by Leo V. Arehart as the new location of the Spokane Maytag store.

●

HUGHES & CO., Spokane, has taken over distributorship of Admiral radios.

●

JENSEN-BYRD CO. is Spokane distributor for the entire Frigidaire line.

THERE ARE "BESTS" IN EVERY INDUSTRY

IN ELECTRICAL APPLIANCES IT'S Sunbeam

★ Automatic MIXMASTER ★ Double-Automatic IRONMASTER ★ Silent AUTOMATIC TOASTER ★ COFFEEMASTER ★ WETPROOF HEATING PAD ★ MASTER CORD and PLUG SET ★ GLASS COFFEE MAKERS FANHEATER ★ FLAT TOASTER ★ Automatic CLOTHES SPRAYER.

Made and guaranteed by

CHICAGO FLEXIBLE SHAFT COMPANY
5600 West Roosevelt Road, Chicago, Ill.
316 Commercial St., Los Angeles, Cal.
921 11th Ave. N., Seattle, Wash.
224 S. W. Temple St., Salt Lake City, Utah
47 YEARS MAKING QUALITY PRODUCTS

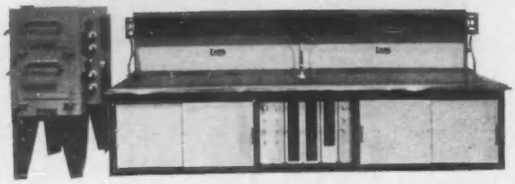
5 REASONS FOR AN AGENCY ACCOUNT

Our Agency Service has five outstanding advantages for anyone having a sizeable investment portfolio:

1. It relieves the client of all bookkeeping details and annoying routine.
2. It prevents losses due to mistakes, to delays in depositing dividends and collecting interest, to failure to observe redemption notices, etc.
3. It provides records helpful in preparing tax returns.
4. Its cost is moderate — frequently it pays for itself.
5. Flexible, it is adapted to the client's individual needs and operates under his direct authority.

TRUST DEPARTMENT

CROCKER FIRST NATIONAL BANK of San Francisco



Specify . . .

LANG

for

HEAVY DUTY ELECTRIC COOKING

"Western made for Western Trade"

For years LANG has served the commercial cooking trade and today their custom built ELECTRIC RANGES, BAKE OVENS, GRIDDLES and other heavy duty equipment bring satisfaction and economy to hundreds of cafes, hotels and institutions all over the west. LANG automatic oven controls, positive drain grease trough, dead front cut-outs and many other exclusive features are reasons for LANG leadership.

★LANG RANGES . . .
BAKE OVENS . . .
GRIDDLES . . .
STOCK POTS . . .

Simplify Electric Cooking

Low operating costs and long life plus the convenience of LANG custom built heavy duty ELECTRIC equipment mean greater satisfaction for operators. LANG ELECTRIC RANGES are built in one, two, three or more ovens . . . custom built to meet individual requirements. Write, phone or wire for further details.

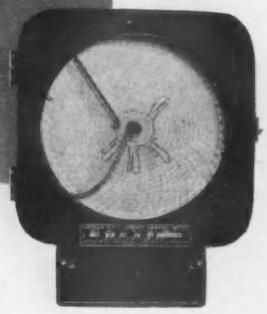
F. S. LANG MFG. CO.
SEATTLE

Chicken Pies uniformly baked in a LANG ELECTRIC BAKE OVEN in the modern kitchen of the Los Angeles Ice Cream Co.

LINCOLN DEMAND METERS

THE *correct* PRINCIPLE

Type CCW Graphic Demand Meter



The capacity of generation and distribution equipment is directly related to the heating effect of the load imposed. Likewise the registration of the Lincoln Maximum Demand Meter depends upon the heating effect of the load.

LINCOLN METER COMPANY
SPRINGFIELD, ILLINOIS

S. F. MARKER, 5409 Woodland Ave., Kansas City, Mo., has been appointed sales representative for S & M Lamp Co.'s flood-light division. He will cover Missouri and eastern Kansas.

●

OSMOSE CORP. OF AMERICA, Buffalo, has appointed George E. Honn Co., San Francisco, Northern California and western Nevada representative of its groundline pole treatment line.

●

TERRITORIAL REPRESENTATION of Triangle Conduit & Cable Co. was changed last month to include the State of Colorado as part of the Chicago territory under the direction of George Butler Electric Sales Co., 552 W. Adams St.

●

DISHMAN TRADING CO., Spokane, has been purchased by H. L. Geesey and Harry Fairbanks. Under the new ownership the store will be enlarged, new departments added and greater stock offered.

●

SUNSET ELECTRIC CO., Seattle Frigidaire distributor, is expected to move into new offices and warehouse at 300 Westlake Ave., north, about the end of this month.

●

NORGE INTERMOUNTAIN CO. has combined its stores into one large sales room at 56 E. Fourth St., south, Salt Lake City, and installed new radio and I.E.S. lamp departments.

●

VALENTINE APPLIANCE CO. has opened new offices at Fourth, south, and Cactus Sts., Salt Lake City.

●

MOVED

TRI-STATE SUPPLY CORP., representing Essex Wire, Ohio Carbon, Homer Commutator, Paranite Wire Cable, New Jersey Wood Finishing and P. D. George Co. in California, Nevada and Arizona, from 722 Towne Ave., Los Angeles, to 544 S. San Pedro St.

H. O. BAUERLE, electrical contractor specializing in ornamental lighting, underground construction and pole lines, to 30-48 Long Beach Ave., Los Angeles.

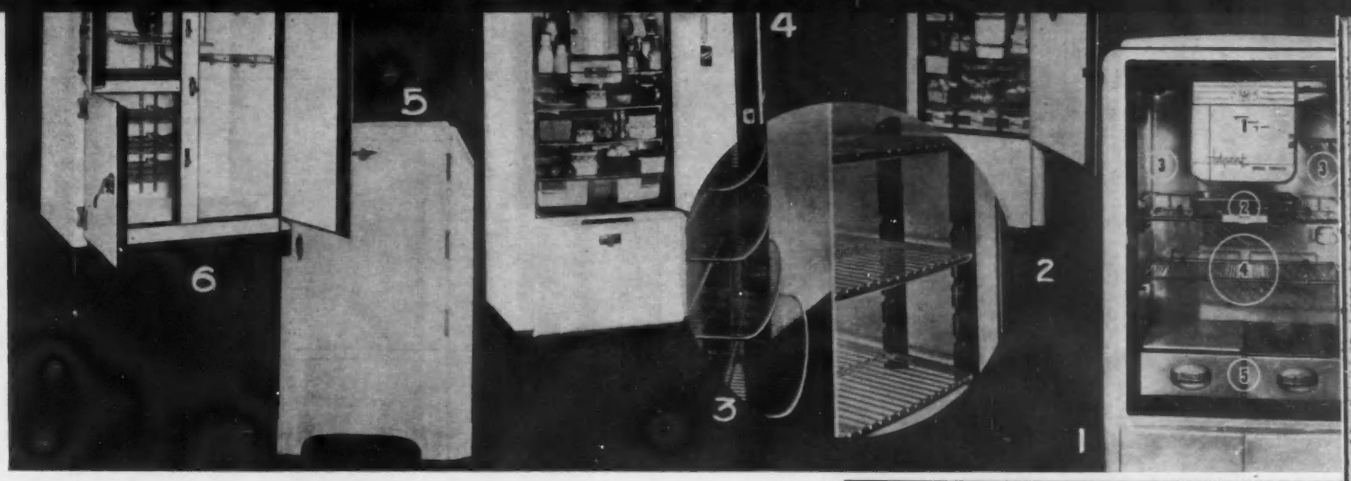
NEWBERY ELECTRIC CORP. from 315 W. Ninth St., Los Angeles, to former location at 1038 W. Venice Blvd.

CRIT L. WOOLSEY, formerly of the General Electric Supply Corp., Portland, to 1509 Camden Ave., West Los Angeles, where he is now representative for Mathias Klein & Sons.

APPLIANCE ELECTRIC SERVICE from 952 N. Western Ave., Los Angeles, into larger quarters at 1142 N. Western Ave.

PALMER ELECTRIC CO., Seattle electrical supply wholesale establishment, into remodeled building at 325 Westlake Ave., North.

TAYLOR ELECTRIC, Hillyard, Wash., to 5107 Market St.



Major Appliance Talking Points

Refrigerators

1. HOTPOINT: Pop-ice tray releases ice cubes two at a time, if desired, leaving the rest intact. Exterior fan, operating only when refrigerator is running, is responsible for new Circulaire cooling, which is said to reduce operating costs and increase storage space. Five Zones of Cold (illustrated) provides right temperature for individual foods. Gliding shelves.

2. NORGE: Sealed odor-proof evaporator with freezer shelves improved to produce ice 25 per cent faster. Metal trays equipped with rubber grids. Nine-point cold control located on panel above ice compartment. Three-position defrosting tray. Adjustable insert shelves.

3. KELVINATOR: Sliding and adjustable shelves (illustrated) can be used in as many as seven positions. Polar power sealed unit makes for faster freezing and quietness. Illuminated dial and built-in thermometer. Ice-cube release.

4. WESTINGHOUSE: Built-in humidity storage drawer for vegetables. Meat storage compartment conserves moisture. Adjustable shelves. Ice-cube release. Two super-storage models also on market.

5. FRIGIDAIRE: Refinements in design and construction are said to reduce operating costs. Quieter operation. Improved ice-cube release.

6. GENERAL ELECTRIC: Storage refrigerators for large cuts of meat (illustrated) have conditioned air cooling unit which cools, humidifies, circulates and washes air. Storage compartment for meats extends from floor to top of refrigerator. Shelves adjustable in half-inch steps.

●

Washers and Ironers

7. NORGE: Washers equipped with sealed-in-oil Autobuilt transmission. "Life-time" lubricated motor. Steam-sealed tub covers are said to assure longer heat retention. New model is the Norge Spin Dry Washer which washes, rinses, blues and dries all in one machine. Ironers are rotary type. Equipped with knee-control, open-end rolls, two roll speeds.

8. HOTPOINT: Seven washers, including five wringer and two spinner-top models, and five ironers are of streamlined design. Sanitary sink and dishwasher (illustrated) features front opening compartment on washer, new waste disposal unit on sink.

9. KELVINATOR: Line is high-lighted by two-tub washer requiring only four steps in washing clothes. Each agitator has separate outside levers which start or stop it automatically. "Pressure-ator" wringer. Capacity of each tub is 18 gal.

10. GENERAL ELECTRIC: Double-tub washer (illustrated) is equipped with new three-blade activator which draws clothes down through water, out towards sides of tub and up to the surface. Spin-basket operates at 870 r.p.m., is driven by automobile type clutch and holds full washer-tub load. Operating cost is said to be one cent an hour.

11. KELVINATOR: Ironer line is headed by Model 99A (illustrated). Model is completely encased in pressed steel cabinet with acid-resisting table top. Thermostats located at each end of shoe mechanism control heat —high, medium and low. Knee lever and finger touch button control the shoe pressure.

●

Ranges

12. HOTPOINT: Five-speed Calrod heating unit providing Speed, 1,300 watts, for quick frying; Half, 650 watts for ordinary cooking; Quarter, 325 watts, for slow frying; Thrift, 160 watts, for simmering; Warm, 80 watts, to keep foods warm. Equipment is standard on all models. Claimed for it is greater speed, more economy.

13. GENERAL ELECTRIC: Heading the line is the new Imperial 60 designed for the household which entertains on a large scale (illustrated). Range has 25 per cent greater capacity. Top surface is Monel metal. Two 2-speed ovens, two master ovens and two broilers. Six Calrod surface units.

14. KELVINATOR: Chromalox superspeed surface units. Single unit Watt Watcher oven is said to cut current consumption and provide more usable space. Non-tipping trays. Porcelain broiler pan with smokeless grill.

15. WESTINGHOUSE: Enlarged SuperOven is capable of baking biscuits in 10 min. from a cold start because of new Heat-Evener which covers lower heating element and directs currents evenly throughout oven. Top of oven has double insulation. Corox Economizer Units have four heats, the lowest, "simmer," using 60 per cent less current than "low." Body of range is one piece.

NORGE emphasizes super-speed cooking elements, with 400 per cent more contact area than other closed units, available as extra equipment. Controlled top of range cooking operates through selector switch in conjunction with electric clock which automatically controls current in left rear burner. This burner may be converted into utility cooker.

NEW PRODUCTS

Temporary Pole Step

A malleable iron step with chain attachment forms a temporary pole step which may be used by linemen between the ground and the first permanent step and at the top of the pole when working on cross arms or wire connections. Device, which can be made by any foundry, may be used on wood, metal or cement poles. Safety is assured since pressure wedges and tightens the chain grip.

Voltage Regulator

Ideal Commutator Dresser Co. has added a voltage regulator of the vibrating type to its regular line of carbon-pile regulators. The new regulator is designed primarily for voltage control of a. c. generators.

Lighting Circuit Control

Control of lighting circuits is accomplished in a new way by a device called "Color-Blend," designed for application where colors are to be presented in sequence, and manufactured by Lockwood Electric Co. It consists of a motor-driven rotating transformer which varies voltage from zero to maximum on three circuits in succession, overlapping to blend, and accomplishing the 3-color cycle in 3 min. Capacities range from 750 to 10,000 watts, connected loads being twice as great. Standard voltage is 110, with 220, 1,100 and 2,200 available without extra cost on larger sizes. Motor is 1/50 hp.

Oil Circuit Breaker Control

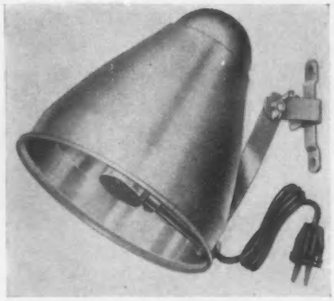
New manual remote control mechanism for oil circuit breakers has been developed by the General Electric Co. Designed for use with Types Fk-42 and FK-143 breakers, the device boasts two advantages: It is claimed that it can be operated at 30 per cent less manual effort because of a lever-acting toggle arrangement in the horizontal hanger and crank at the breaker. Strain on the supporting panel is reduced 75 per cent by arranging the mechanism so that the resultant operating force is concentrated closer to the support than in former types. Included in the unit are a Type HC-2 lever, with provisions for trip coils, undervoltage device, auxiliary switches and mechanical interlocks.

Portable Recording Thermometer

New compact portable recording thermometer for industrial use in travelling baking ovens, finishing ovens, enameling ovens, etc., has been developed by the Bristol Co. Passing through the oven on the conveyor with the "work," the instrument gives a continuous record of the temperatures to which the heated product is subjected.

High Intensity Spotlight

Hot Spot is a new high intensity spot-light for use in window displays after the diminished traffic of late night has made it inadvisable to continue the full lighting of early evening. Introduced by S & M Lamp Co., the spot is for use with a standard 100-watt silvered bowl lamp. Beam pattern can be regulated by a control louver. The light measures 7 in. outside diameter.



Reach-in Refrigerator

Carrier has introduced a new reach-in refrigerator for use in hospitals, restaurants, small stores, etc. Unit has 35 cu. ft. of space. Forced convection system supplies refrigeration.

PRODUCT DATA

101:
WIRE, ROD AND STRIP FORM ALLOYS; description, applications, price per pound of alloys, wire data, range of uses, current temperature characteristics, resistance and feet per pound. Alloy Metal Wire Co.

102:
EJECTOR CENTRIFUGAL PUMPS, including a newly introduced vertical close-coupled motor-driven unit for general service in deep or shallow wells, fully described and illustrated. Fairbanks, Morse & Co.

Free to you . . . Any of these instructive bulletins . . . Address a post card to ELECTRICAL WEST 883 Mission St., San Francisco, Calif. . . . drop it in the next mail.

103:
FRACTIONAL HORSEPOWER MOTORS; 24-page bulletin giving information on electrical characteristics, most effective applications to motor driven machinery and appliances and description of several types. Century Electric Co.

104:
WIRING DEVICES classified in groups in latest catalogue. Bryant Electric Co.

106:
REMOTE CONTROL SWITCHES; diagrams and illustrations showing details of operation, accomplishments, etc. Automatic Switch Co.

107:
BUSHING TYPE CURRENT TRANSFORMERS for metering purposes; leaflet describing field of application, principle of operation, loading burden and guaranteed accuracies. Pacific Electric Mfg. Corp.

108:
THERMEMETER RECORDERS AND CONTROLLERS, potentiometer and millivolt-meter pyrometers and controllers described. Bristol Co.

109:
CONCENTRIC TYPE CABLES for direct earth installation on single phase systems; description, illustrations and applications. General Cable Corp.

110:
TREE WIRE; description, tests and insulation thickness. Anaconda Wire & Cable Co.

111:
PYRANOL DISTRIBUTION CAPACITATORS, individual pole-type units, described and illustrated. General Electric Co.

112:
AIR CIRCUIT BREAKER SWITCHBOARDS, safety enclosed, illustrated. General Electric Co.

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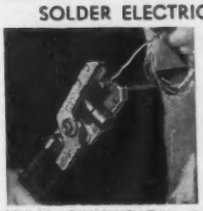
SOLDER ELECTRICALLY



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● Here we are again, starting another twelve months of business accomplishment.

It's a good time to look forward — a good time to begin making good the resolutions we talked about at the end of the old year.

We are ready for the test. An United Industry, we have learned by experience the high value of cooperation in Business Development.

We have learned the practical worth of Dealer-Utility team work — the benefits to be gained from Appliance Society leadership—and the dividends to be reaped from synchronized Sales Campaign Advertising.

● *The 1938 Sales Plan is ready. Advertising plans are ready. The P. G. and E., is ready to do its full part in a new Forward Drive throughout the New Year.*

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PACIFIC GAS AND ELECTRIC COMPANY

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Full Speed Ahead to Better Living

Every salesman knows that you cannot sell a man an electric pump by telling him how good it is. A customer doesn't want a pump, as such—but he does want the profits, efficiency and leisure it brings to him personally.

The electrical industry is closely associated with better living. More convenience and comfort in the home, increased efficiency in business, industry, agriculture—all have come by the adoption of modern electrical methods.

Let us join forces in 1938 to continue to promote, not only the sales of ranges, toasters and lamps, but better living. Let us keep on telling our customers how they will benefit by the various uses of electricity. The end of the year will find homes more comfortable, business more profitable —and the electrical industry will prosper with its customers.

Pacific Coast Electrical Bureau

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